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SECTION 1

SUMMARY

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PRODUCT SAFETY SERVICING GUIDELINES FOR VIDEO PRODUCTS

IMPORTANT SAFETY NOTICE

This manual was prepared for use only by properly trained audio-video service technicians.

When servicing this product, under no circumstances should the original design be modified or altered without permission from ZENITH Electronics Corporation. All components should be replaced only with types identical to those in the original circuit and their physical location, wiring and lead dress must conform to original layout upon completion of repairs.

Special components are also used to prevent x-radiation, shock and fire hazard. These components are indicated by the letter "x" included in their component designators and are required to maintain safe performance. No deviations are allowed without prior approval by ZENITH Electronics Corporation.

Circuit diagrams may occasionally differ from the actual circuit used. This way, implementation of the latest safety and performance improvement changes into the set is not delayed until the new service literature is printed.

CAUTION: Do not attempt to modify this product in any way. Never perform customized installations without manufacturer's approval. Unauthorized modifications will not only void the warranty, but may lead to property damage or user injury.

Service work should be performed only after you are thoroughly familiar with these safety checks and servicing guidelines.

GRAPHIC SYMBOLS

The exclamation point within an equilateral triangle is intended to alert the service personnel to important safety information in the service literature.

The lightning flash with arrowhead symbol within an equilateral triangle is intended to alert the service personnel to the presence of noninsulated "dangerous voltage" that may be of sufficient magnitude to constitute a risk of electric shock.

The pictorial representation of a fuse and its rating within an equilateral triangle is intended to convey to the service personnel the following fuse replacement caution notice:

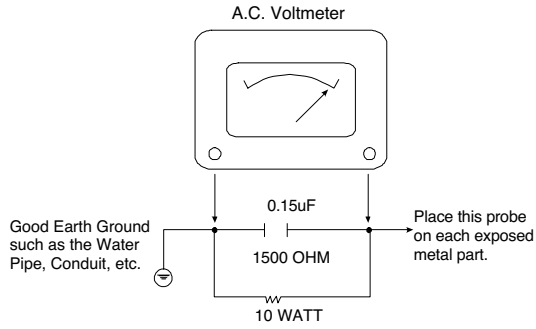
CAUTION: FOR CONTINUED PROTECTION AGAINST RISK OF FIRE, REPLACE ALL FUSES WITH THE SAME TYPE AND RATING AS MARKED NEAR EACH FUSE.

SERVICE INFORMATION

While servicing, use an isolation transformer for protection from AC line shock. After the original service problem has been corrected, make a check of the following:

FIRE AND SHOCK HAZARD

1. Be sure that all components are positioned to avoid a possibility of adjacent component shorts. This is especially important on items trans-ported to and from the repair shop.
2. Verify that all protective devices such as insulators, barriers, covers, shields, strain reliefs, power supply cords, and other hardware have been reinstalled per the original design. Be sure that the safety purpose of the polarized line plug has not been defeated.
3. Soldering must be inspected to discover possible cold solder joints, solder splashes, or sharp solder points. Be certain to remove all loose foreign particles.
4. Check for physical evidence of damage or deterioration to parts and components, for frayed leads or damaged insulation (including the AC cord), and replace if necessary.
5. No lead or component should touch a high current device or a resistor rated at 1 watt or more. Lead tension around protruding metal surfaces must be avoided.
6. After reassembly of the set, always perform an AC leakage test on all exposed metallic parts of the cabinet (the channel selector knobs, antenna terminals, handle and screws) to be sure that set is safe to operate without danger of electrical shock. DO NOT USE A LINE ISOLATION TRANSFORMER DURING THIS TEST. Use an AC voltmeter having 5000 ohms per volt or more sensitivity in the following manner: Connect a 1500 ohm, 10 watt resistor, paralleled by a .15 mfd 150V AC type capacitor between a known good earth ground water pipe, conduit, etc.) and the exposed metallic parts, one at a time. Measure the AC voltage across the combination of 1500 ohm resistor and .15 mfd capacitor. Reverse the AC plug by using a non-polarized adaptor and repeat AC voltage measurements for each exposed metallic part. Voltage measured must not exceed 0.75 volts RMS. This corresponds to 0.5 milliamp AC. Any value exceeding this limit constitutes a potential shock hazard and must be corrected immediately.



TIPS ON PROPER INSTALLATION

1. Never install any receiver in a closed-in recess, cubbyhole, or closely fitting shelf space over, or close to, a heat duct, or in the path of heated air flow.
2. Avoid conditions of high humidity such as: outdoor patio installations where dew is a factor, near steam radiators where steam leakage is a factor, etc.
3. Avoid placement where draperies may obstruct venting. The customer should also avoid the use of decorative scarves or other coverings that might obstruct ventilation.
4. Wall- and shelf-mounted installations using a commercial mounting kit must follow the factory-approved mounting instructions. A product mounted to a shelf or platform must retain its original feet (or the equivalent thickness in spacers) to provide adequate air flow across the bottom. Bolts or screws used for fasteners must not touch any parts or wiring. Perform leakage tests on customized installations.
5. Caution customers against mounting a product on a sloping shelf or in a tilted position, unless the receiver is properly secured.
6. A product on a roll-about cart should be stable in its mounting to the cart. Caution the customer on the hazards of trying to roll a cart with small casters across thresholds or deep pile carpets.
7. Caution customers against using extension cords. Explain that a forest of extensions, sprouting from a single outlet, can lead to disastrous consequences to home and family.

SERVICING PRECAUTIONS

CAUTION : Before servicing the COMBI HOME THEATER SYSTEM covered by this service data and its supplements and addends, read and follow the SAFETY PRECAUTIONS.
NOTE : if unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions in this publications, always follow the safety precautions.
Remembers Safety First:

General Servicing Precautions

1. Always unplug the COMBI HOME THEATER SYSTEM AC power cord from the AC power source before:
   (1) Removing or reinstalling any component, circuit board, module, or any other assembly.
   (2) Disconnection or reconnecting any internal electrical plug or other electrical connection.
   (3) Connecting a test substitute in parallel with an electrolytic capacitor.
   Caution : A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Do not spray chemicals on or near this COMBI HOME THEATER SYSTEM or any of its assemblies.

3. Unless specified otherwise in this service data, clean electrical contacts by applying an appropriate contact cleaning solution to the contacts with a pipe cleaner, cotton-tipped swab, or comparable soft applicator.
   Unless specified otherwise in this service data, lubrication of contacts is not required.

4. Do not defeat any plug/socket B+ voltage interlocks with whitch instruments covered by this service manual might be equipped.

5. Do not apply AC power to this COMBI HOME THEATER SYSTEM and/or any of its electrical assemblies unless all solid-state device heat sinks are cerrectly installed.

6. Always connect test instrument ground lead to the appropriate ground before connection the test instrument positive lead. Always remove the test instrument ground lead last.

Insulation Checking Procedure

Disconnect the attachment plug from the AC outlet and turn the power on. Connect an insulation resistance meter(500V) to the blades of the attachment plug. The insulation resistance between each blade of the attachment plug and accessible conductive parts (Note 1) should be more than 1M-ohm.
Note 1 : Accessible Conductive Parts including Metal panels, Input terminals, Earphone jacks, etc.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field effect transistors and semiconductor chip components.
The following techniques should be used to help reduce the incidence of component damage caused by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed for potential shock reasons prior to applying power to the unit under test.

2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.

3. Use only a grouned-tip soldering iron to solder or unsolder ES devices.

4. Use only an anti-static solder removal device. Some solder removal devices not classified a “anti-static” can generate electrical charges sufficient to damage ES devices.

5. Do not use freon-propelled chemicals. These can generate electrical charge sufficient to damage ES devices.

6. Do not remove a replacement ES device from its protec tive package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil, or comparable conductive material).

7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.

   Caution : Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.

8. Minimize bodily motions when handling unpackaged replacement ES devices. (Normally harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

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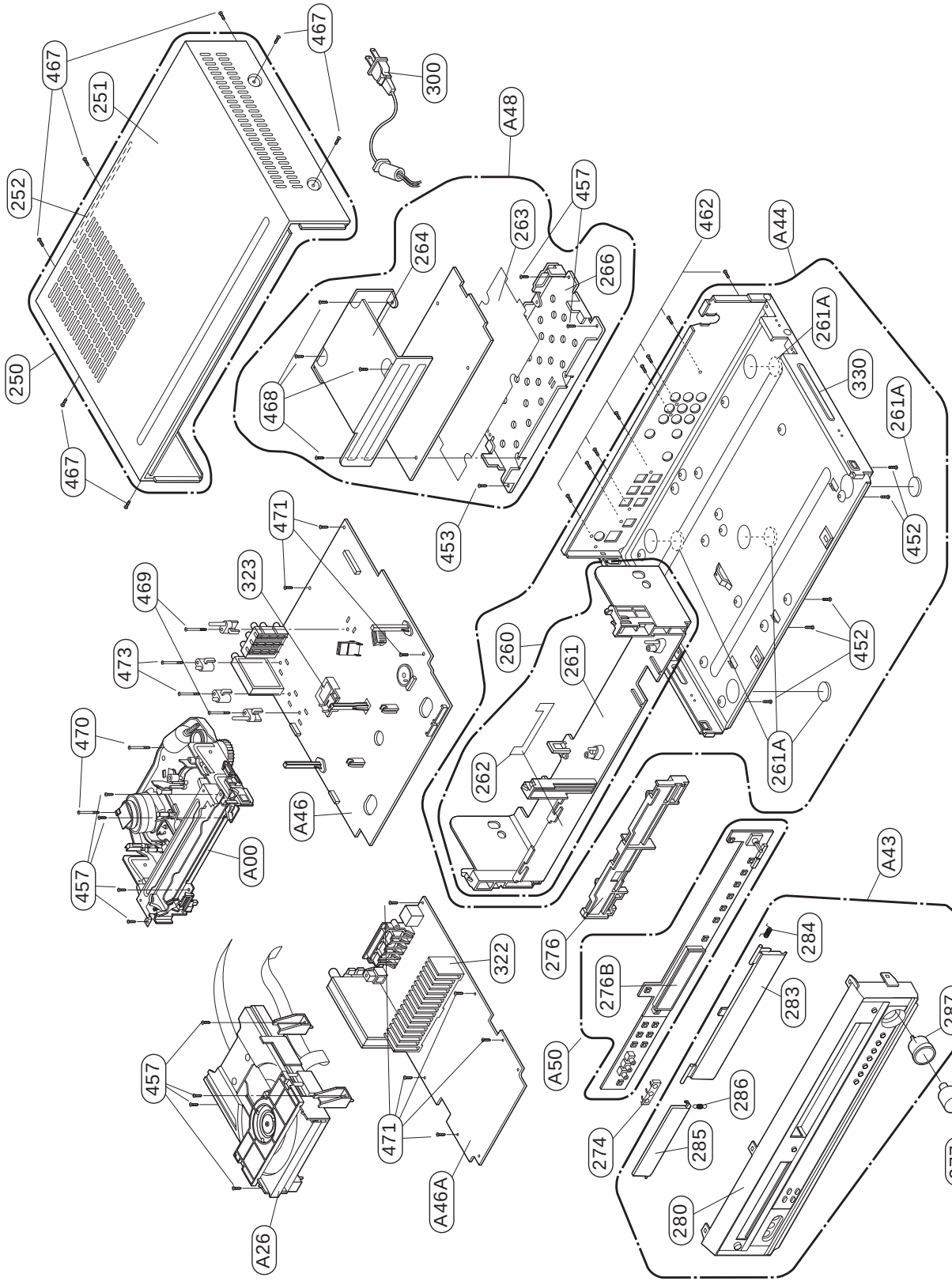
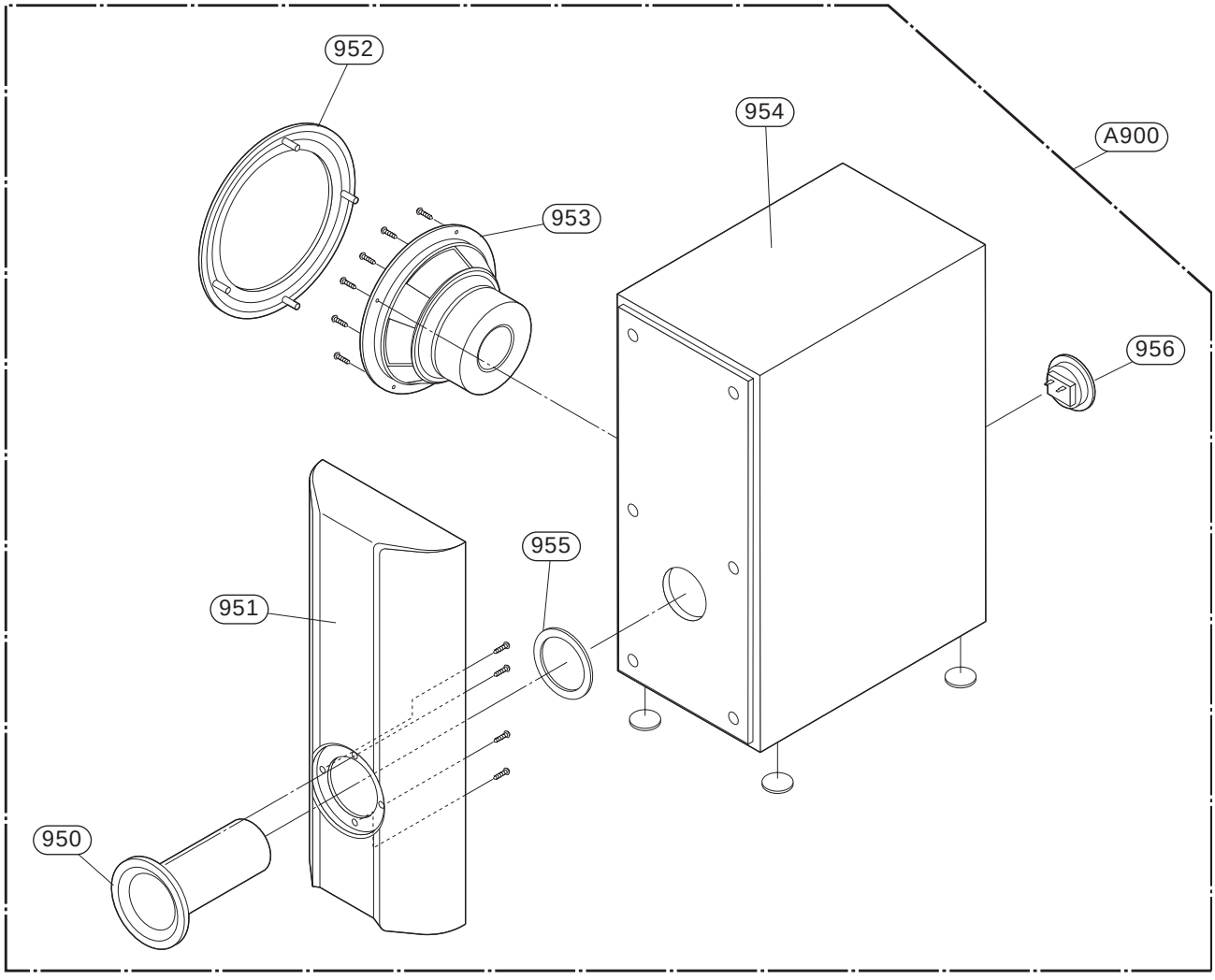
EXPLODED VIEWS

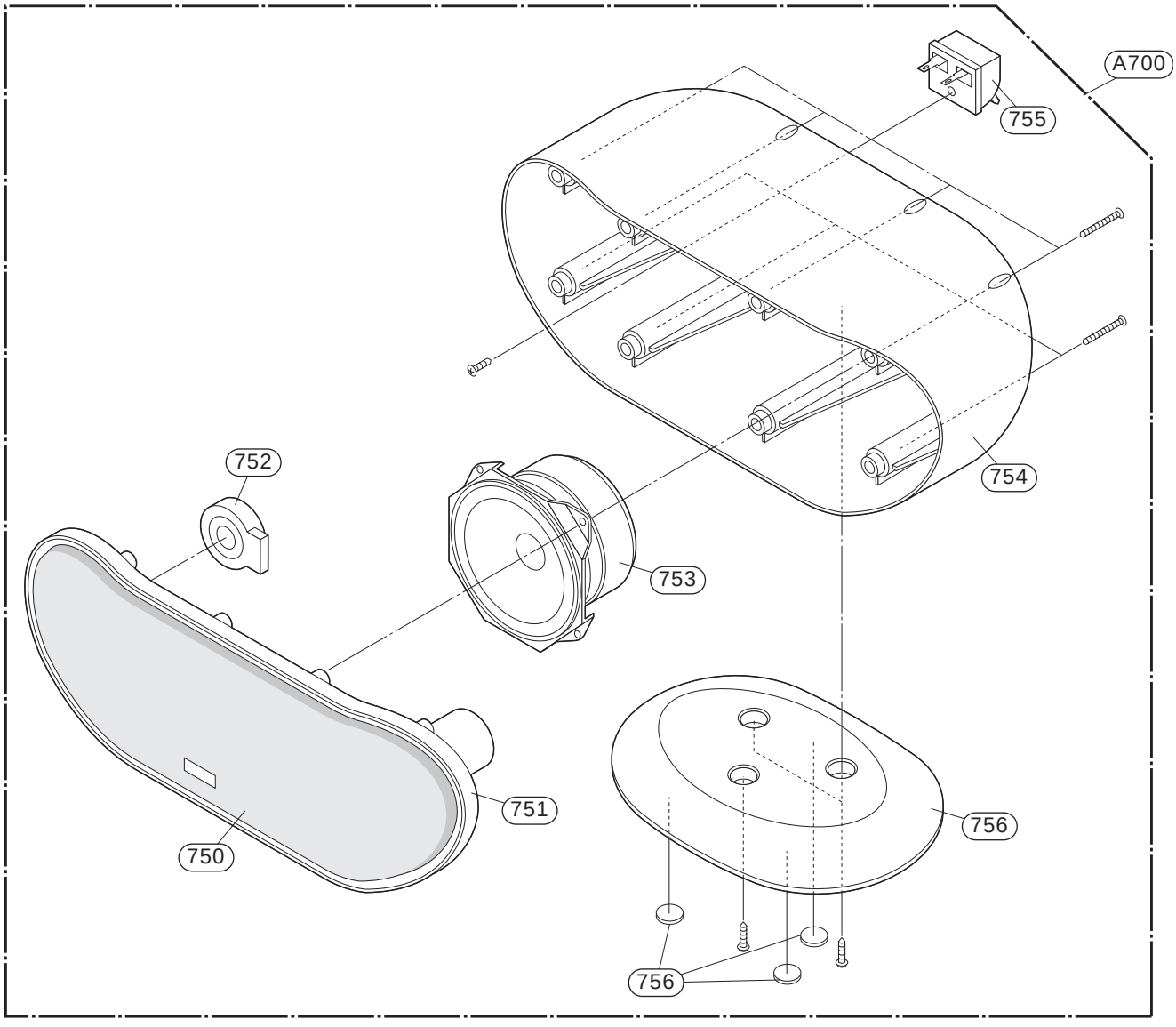
1. Cabinet and Main Frame Section



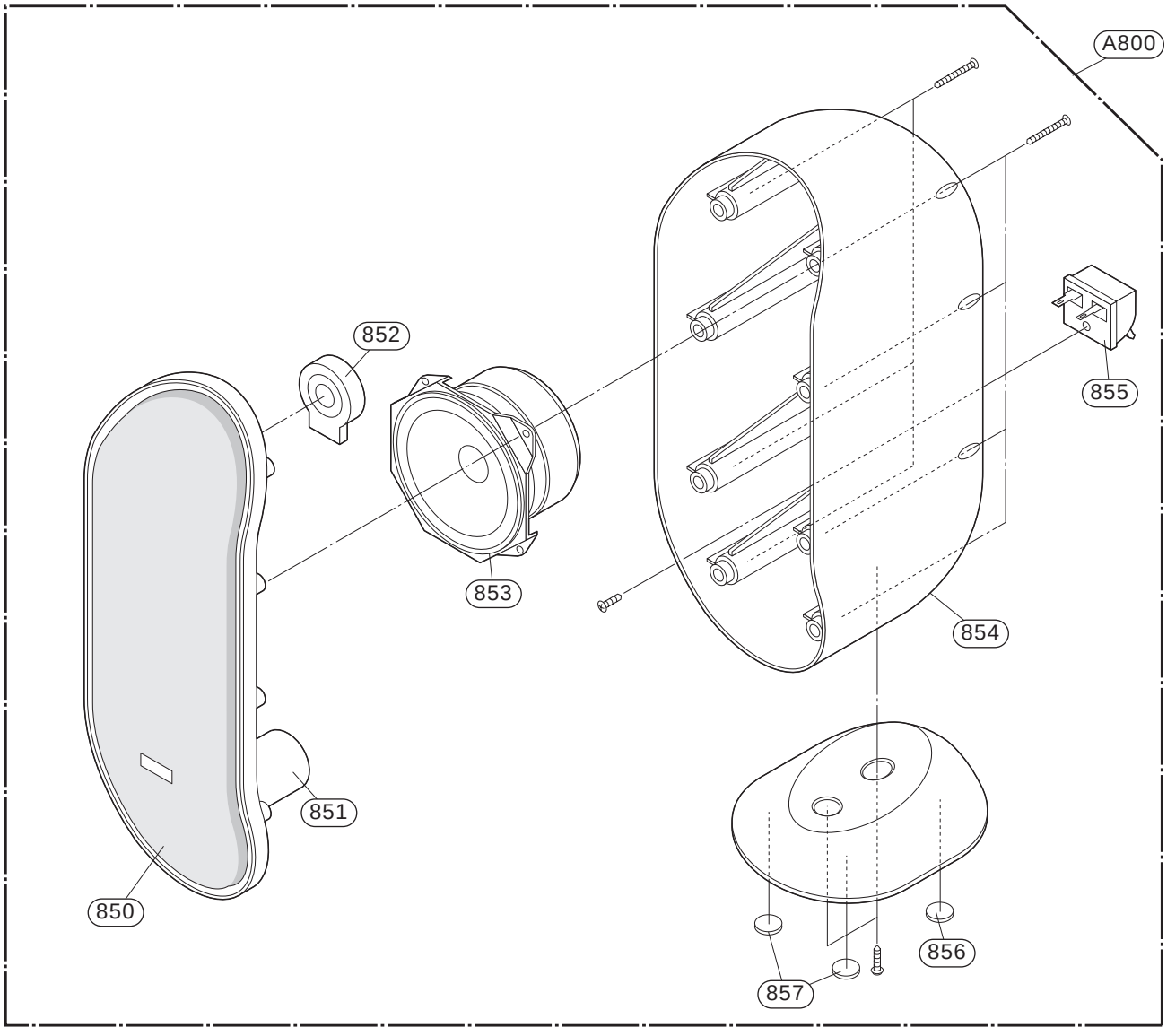
2. Woofer Speaker Section (LHS-C640W)



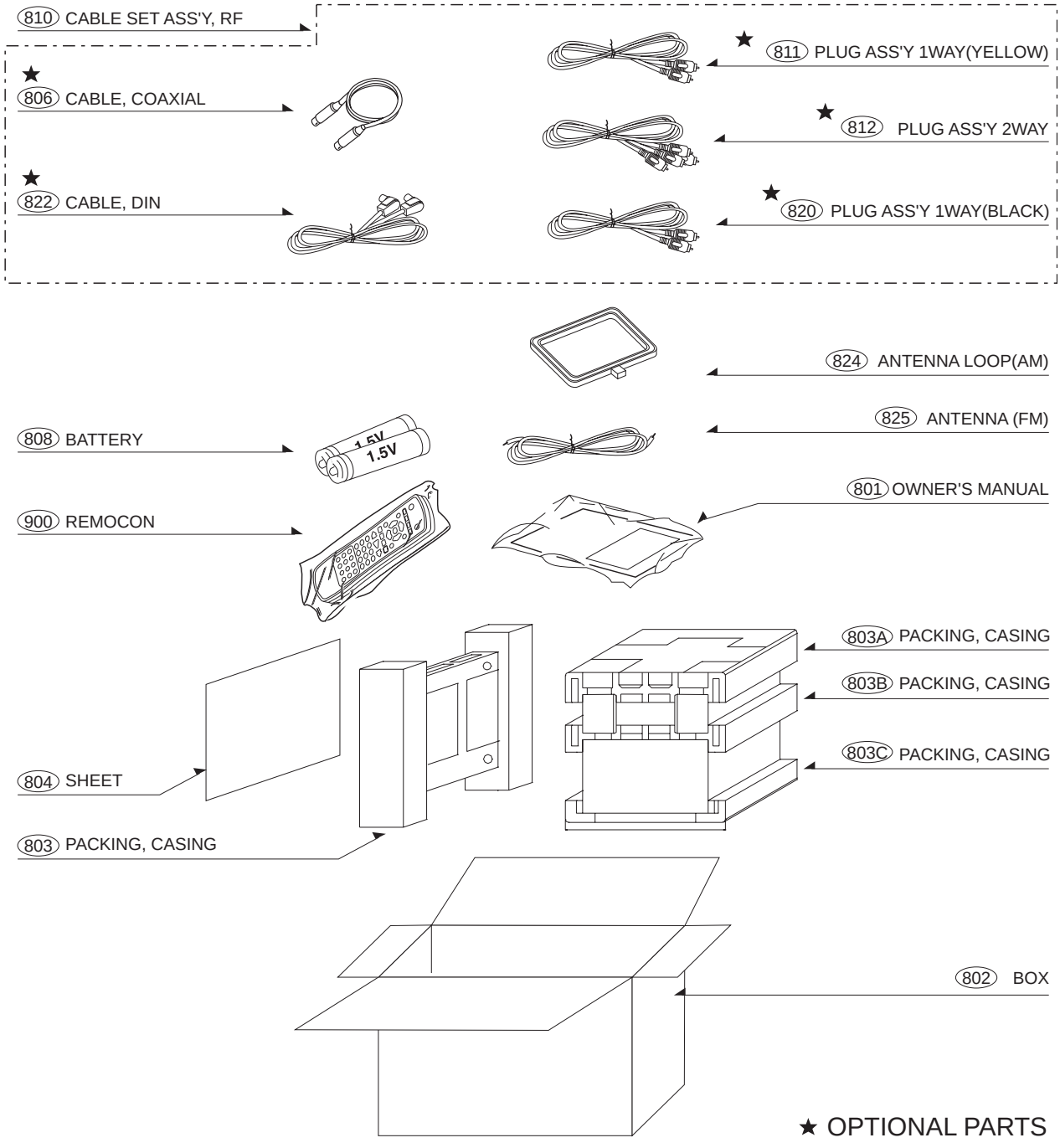
3. Speaker Center Section (LHS-C640C)



4. Speaker Rear/Front Section (LHS-C640T)



5. Packing Accessory Section



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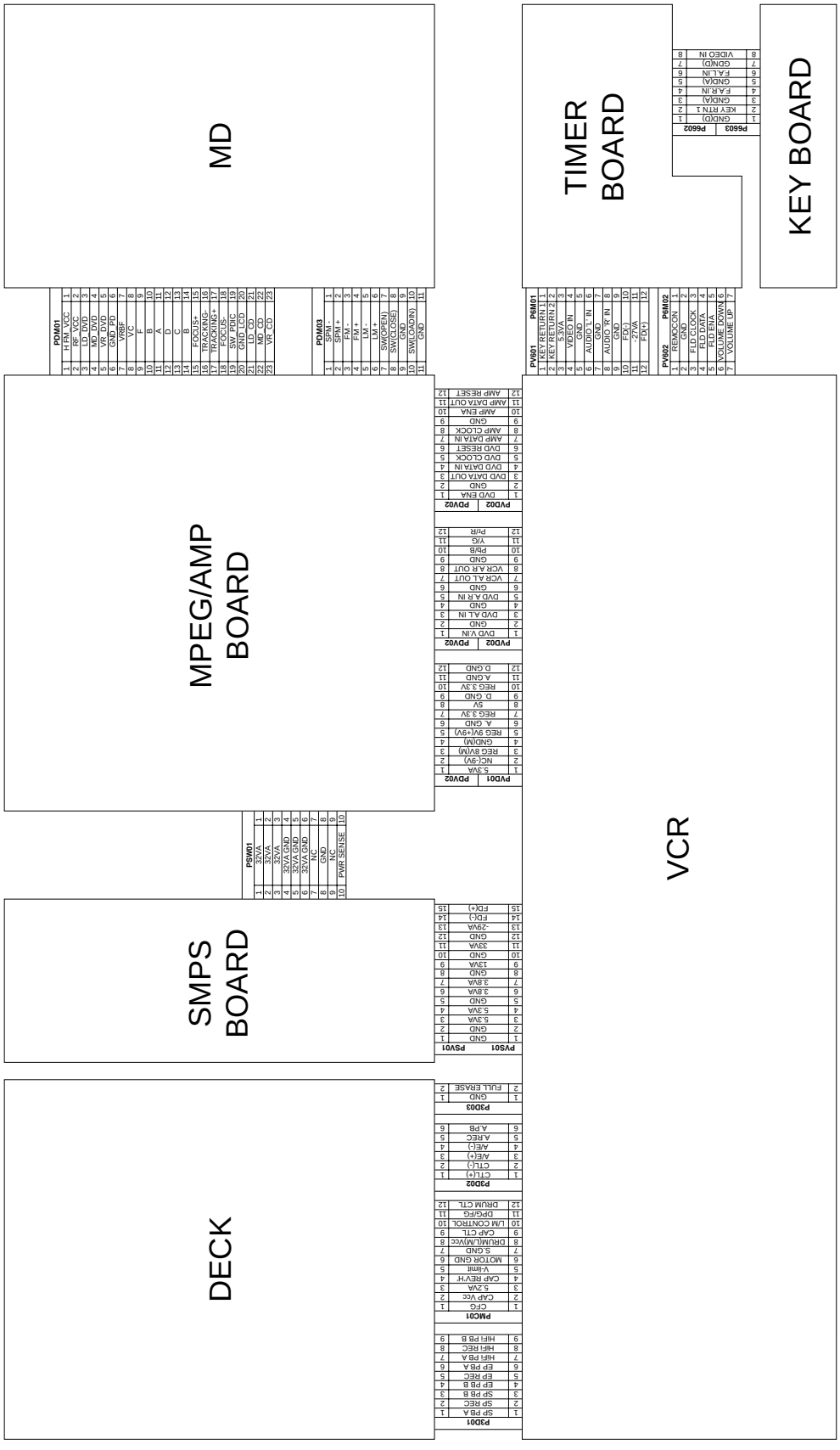
OVERALL WIRING DIAGRAM



VCR PART
ELECTRICAL ADJUSTMENT PROCEDURES

1. Servo Adjustment

1) PG Adjustment

• Test Equipment
  a) OSCILLOSCOPE
  b) NTSC MODEL : NTSC SP TEST TAPE

• Adjustment And Specification

MODE	MEASUREMENT POINT	ADJUSTMENT POINT	SPECIFICATION
PLAY	V.Out H/SW(W373, W374)	R/C TRK JIG KEY	6.5 ± 0.5H

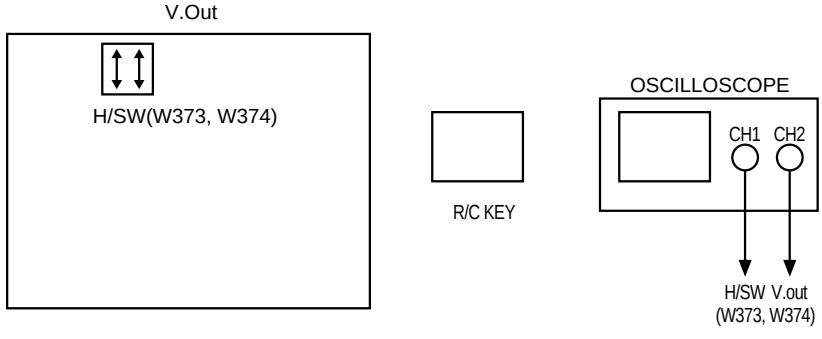
• Adjustment Procedure

a) Insert the SP Test Tape and play.
b) Press the “O” key on the Remote controller and the “PLAY” key on the Front Panel the same time, the unit then goes in to Tracking initial mode.
c) Trigger the mixed Combo Video Signal of CH2 to the CH1 H/SW(W373, W374), and then check the distance (time difference), which is from the selected A(B) Head point of the H/SW(W373, W374) signal to the starting point of the vertical synchronized signal, to 6.5H ± 0.5H (412μs, 1H=63μs).
  Note - Press FRONT CH UP KEY and FRONT PLAY KEY on Deck playback, and it goes in to ATR PRESET. after the SP Test Tape is inserted.

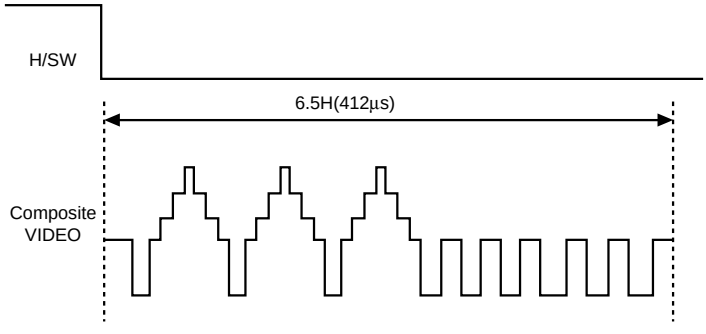
• PG Adjustment Method

a-1) Playback the SP standard tape
b-2) Press the “O” key on the Remote controller and the “PLAY” key on the Front Panel the same time, Tracking initial mode.
c-3) Repeat the above step(No.b-2), the unit will then finish the PG adjusting automatically.
d-4) Stop the playback, the unit then exits PG adjusting mode after saving the PG data.

• CONNECTION



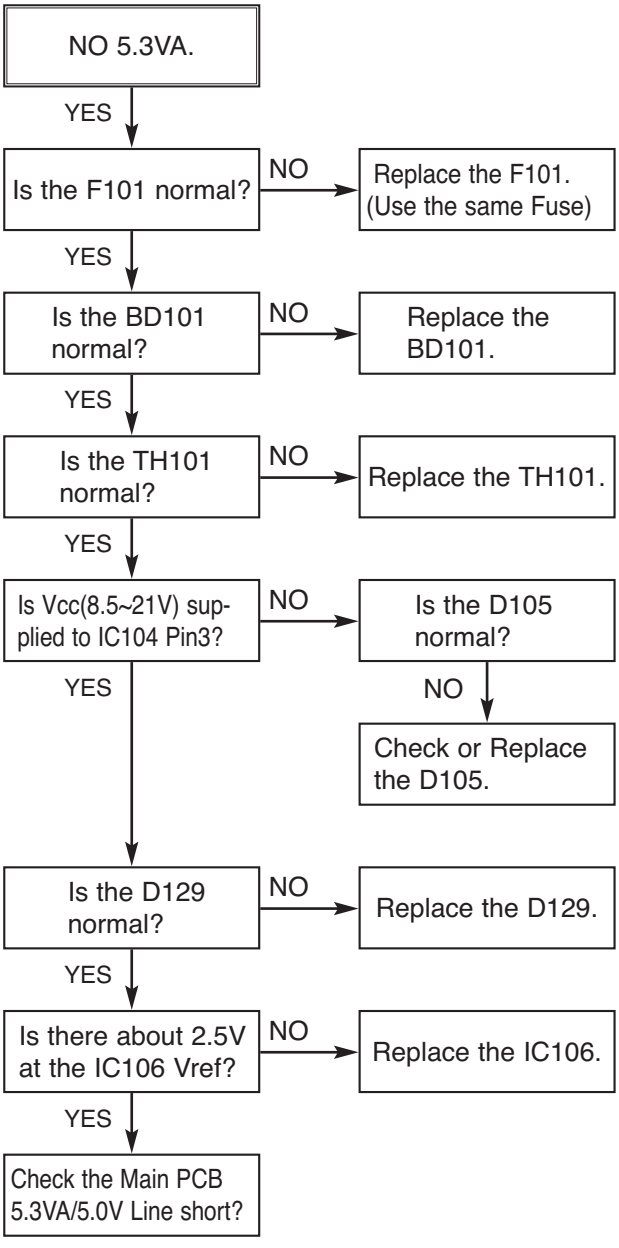
• WAVEFORM



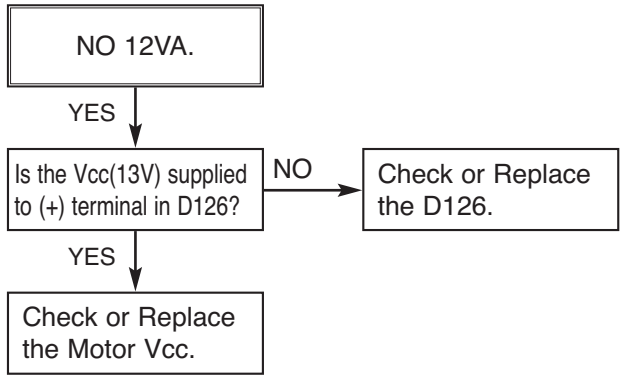
ELECTRICAL TROUBLESHOOTING GUIDE

1. Power(SMPS) CIRCUIT

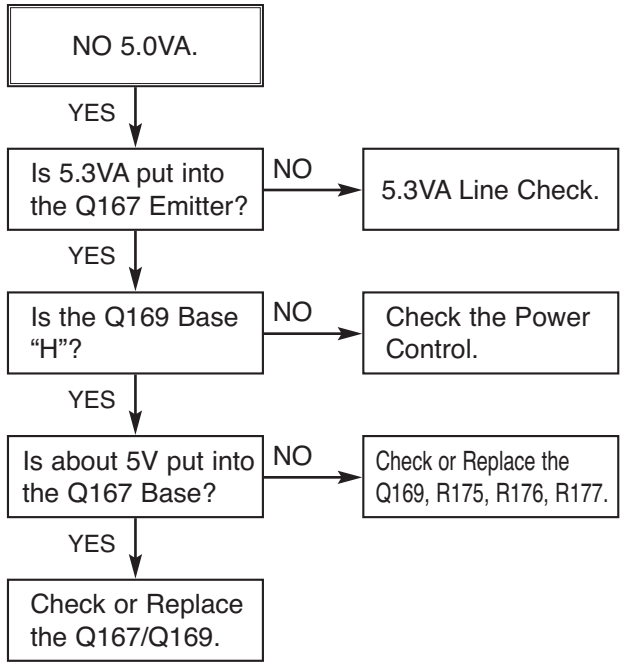
(1) No 5.3VA (SYS/Hi-Fi/TUNER)



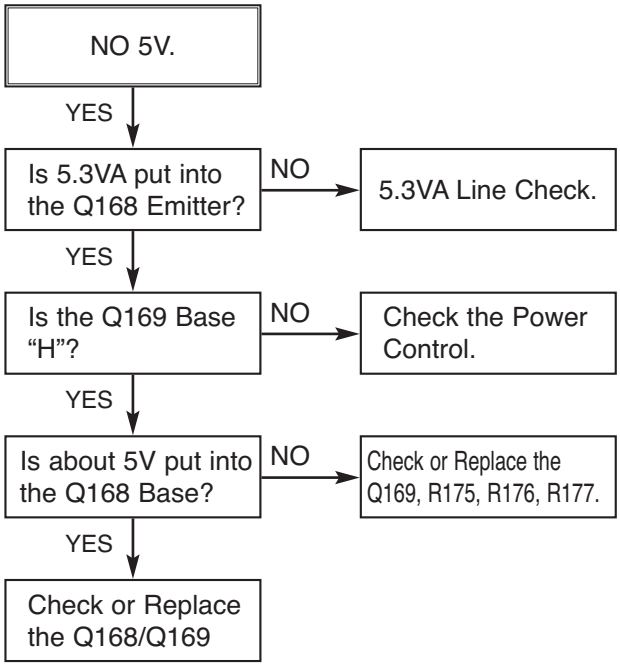
(2) No 12VA (TO CAP, DRUM MOTOR)



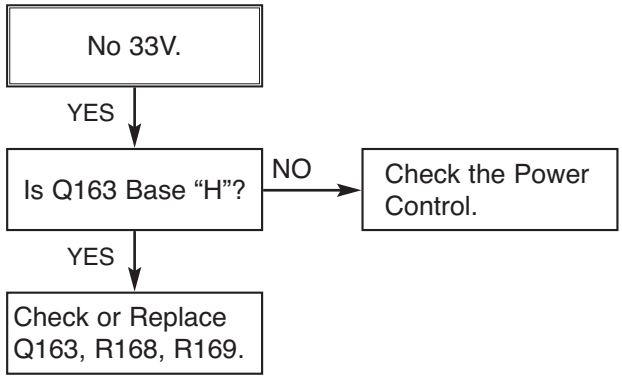
(3) No 5.0V (SYS/Hi-Fi/TUNER)



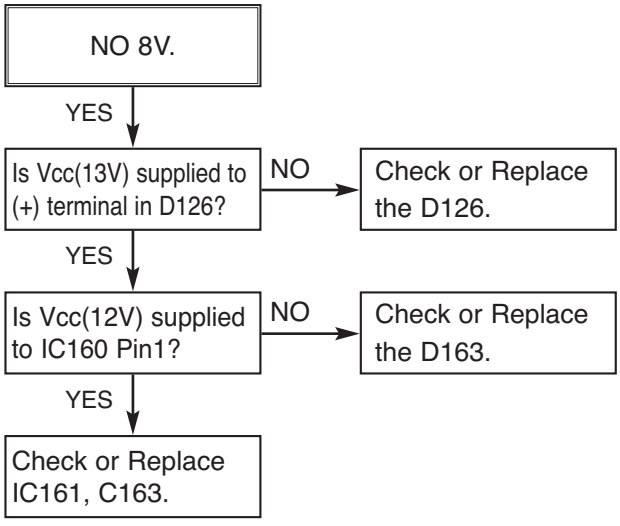
(4) No 5V (TO DVD)



(5) No 33V (TUNER)

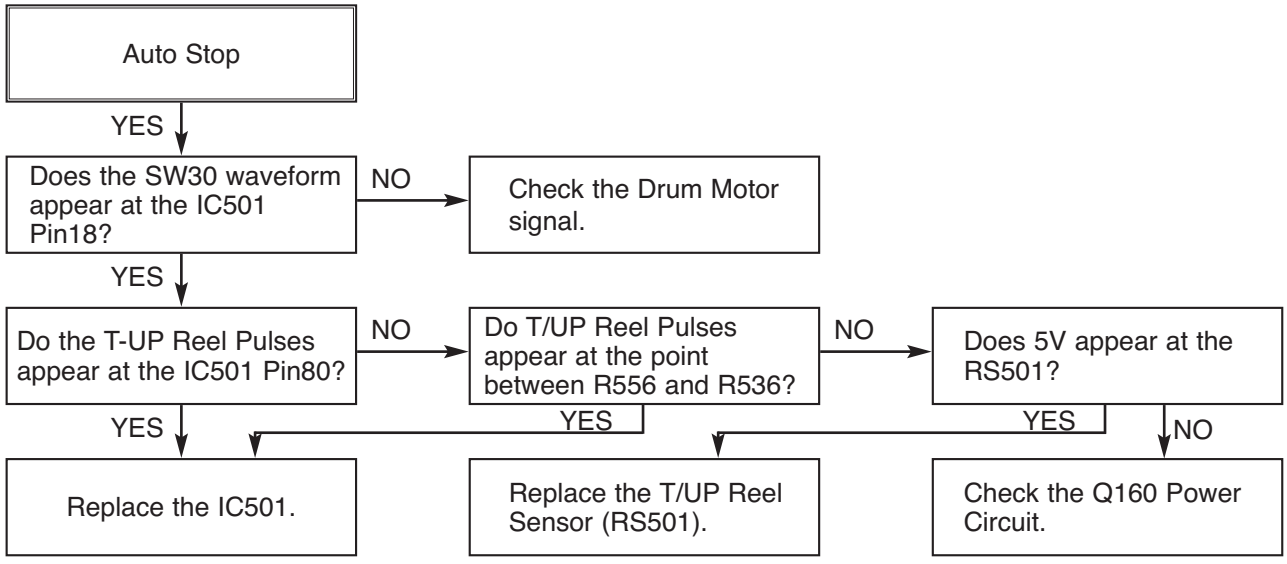


(6) No 8V(TO DVD)

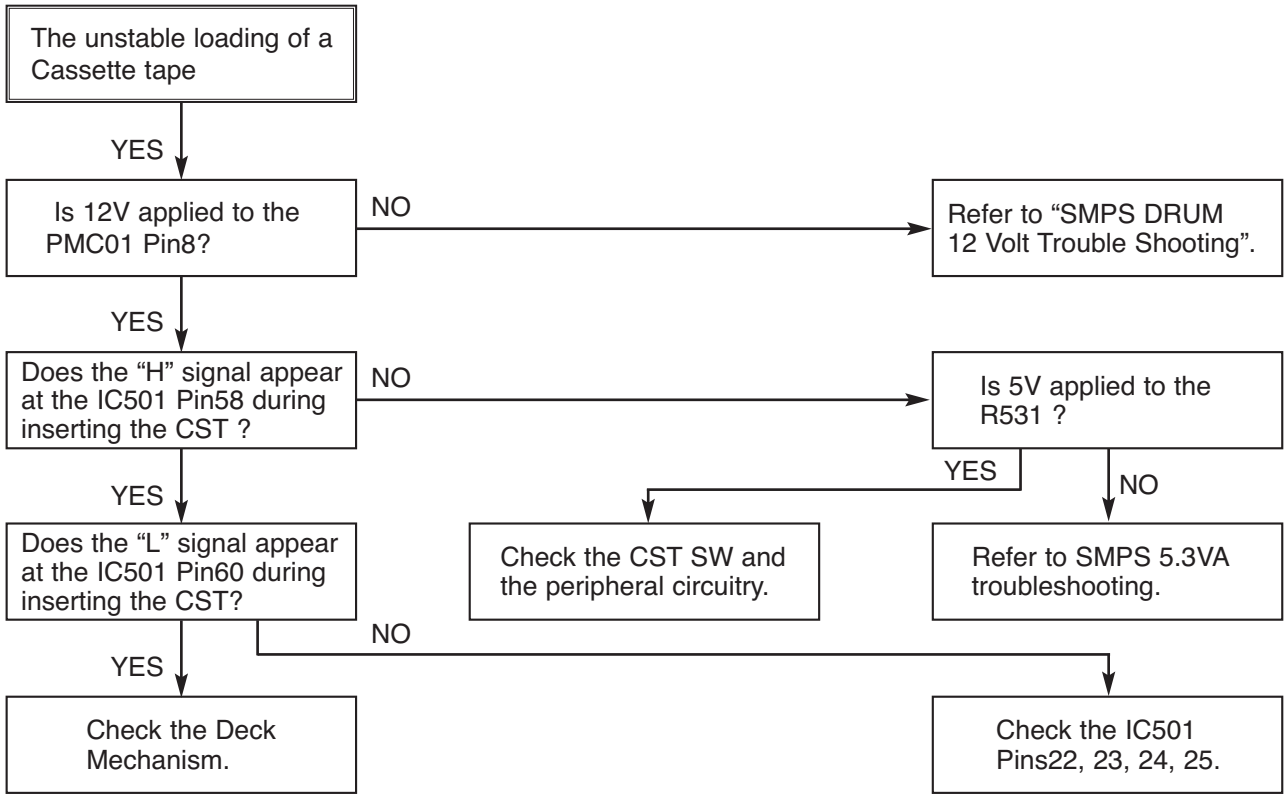


2. SYSTEM/KEY CIRCUIT

(1) AUTO STOP



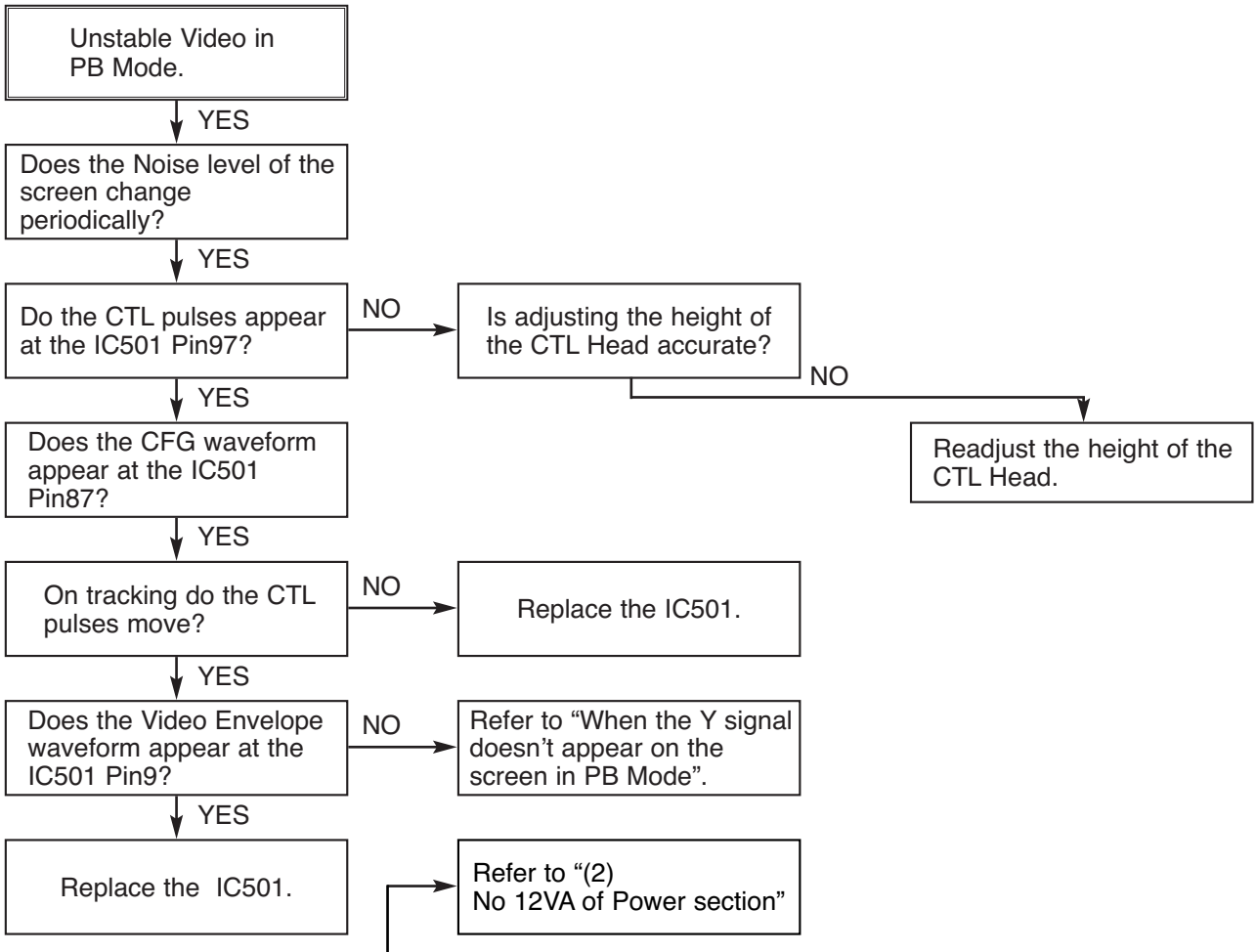
(2) The unstable loading of a Cassette tape


The unstable loading of a Cassette tape
YES
Is 12V applied to the PMC01 Pin8?
NO
Refer to “SMPS DRUM 12 Volt Trouble Shooting”.
YES
Does the “H” signal appear at the IC501 Pin58 during inserting the CST ?
NO
Is 5V applied to the R531 ?
YES
NO
YES
Does the “L” signal appear at the IC501 Pin60 during inserting the CST?
Check the CST SW and the peripheral circuitry.
Refer to SMPS 5.3VA troubleshooting.
NO
YES
Check the Deck Mechanism.
Check the IC501 Pins22, 23, 24, 25.

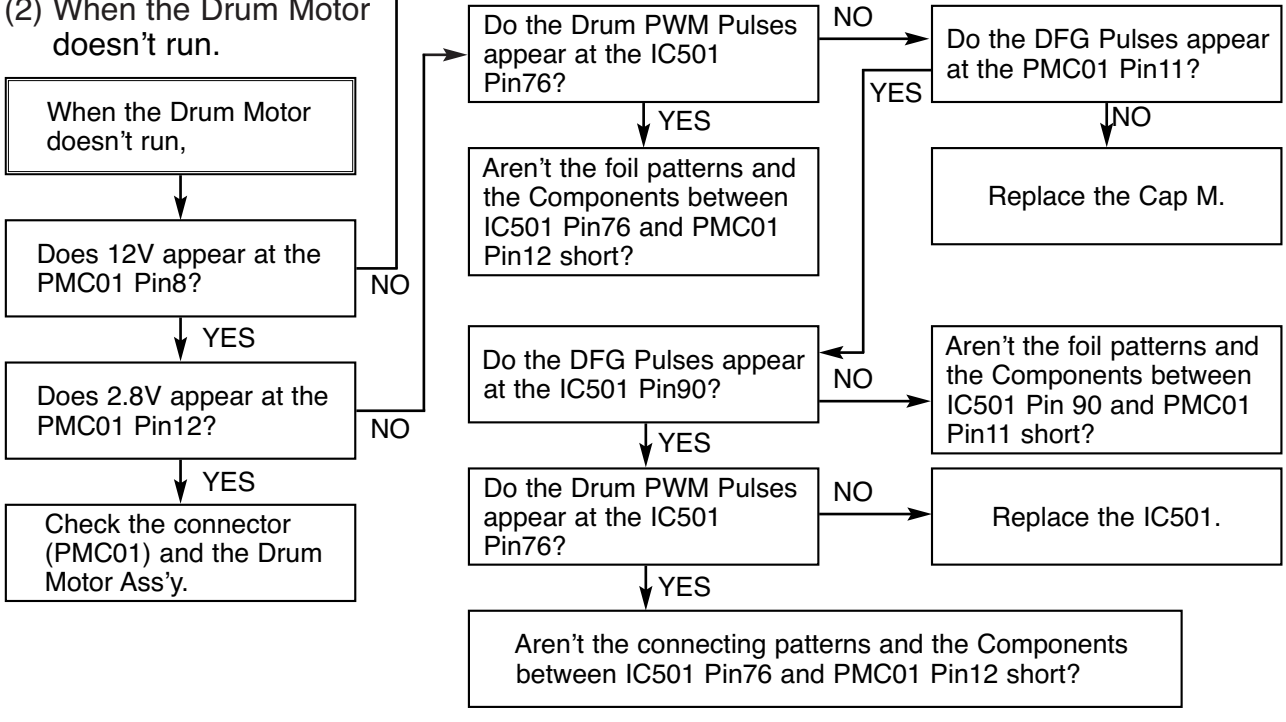
Caution : Auto stop can occur because Grease or Oil has dried up

3. SERVO CIRCUIT

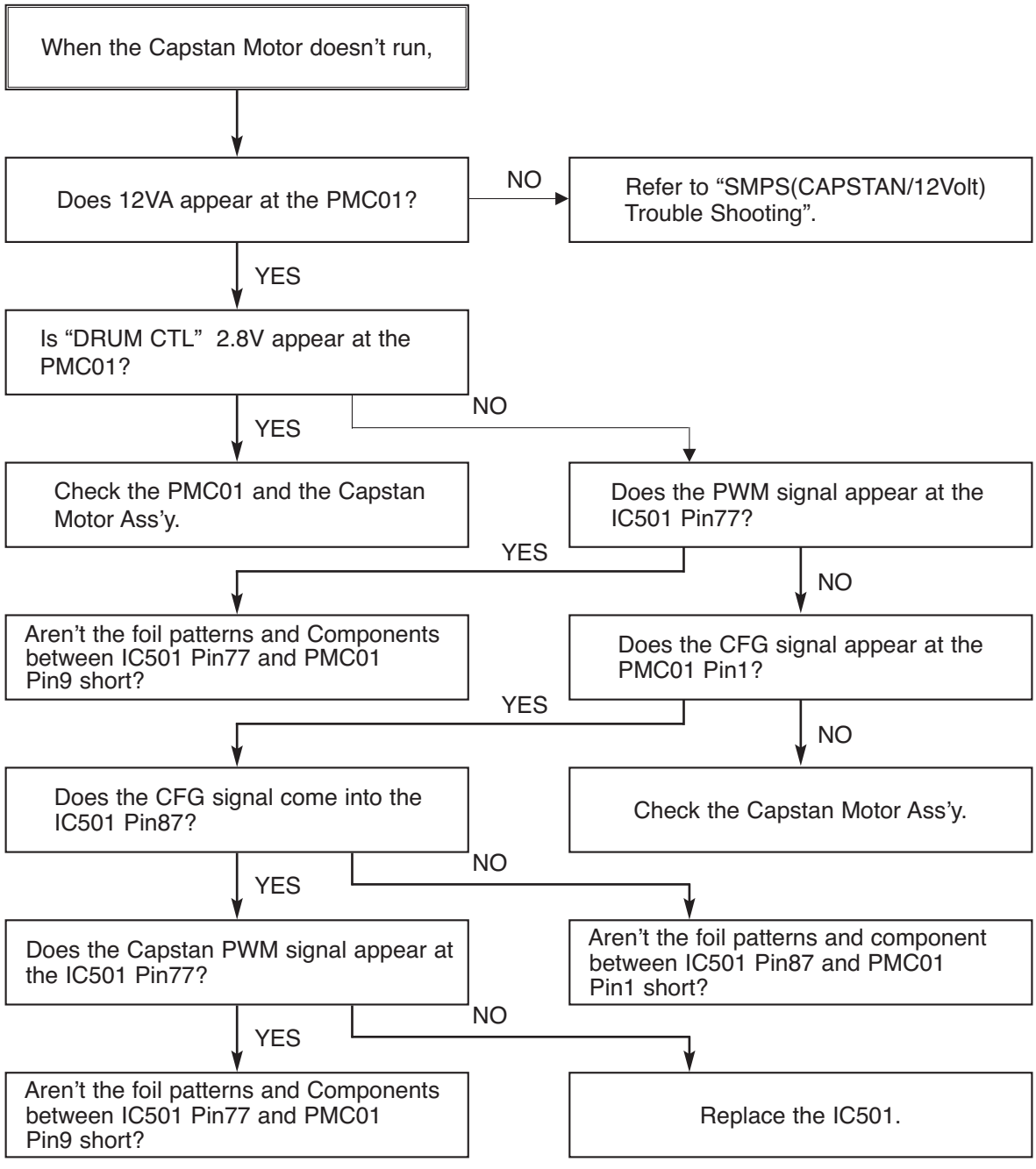
(1) Unstable Video in PB MODE


Unstable Video in PB Mode.
YES
Does the Noise level of the screen change periodically?
YES
Do the CTL pulses appear at the IC501 Pin97?
NO
Is adjusting the height of the CTL Head accurate?
NO
Readjust the height of the CTL Head.
YES
Does the CFG waveform appear at the IC501 Pin87?
YES
On tracking do the CTL pulses move?
NO
Replace the IC501.
YES
Does the Video Envelope waveform appear at the IC501 Pin9?
NO
Refer to "When the Y signal doesn't appear on the screen in PB Mode".
YES
Replace the IC501.

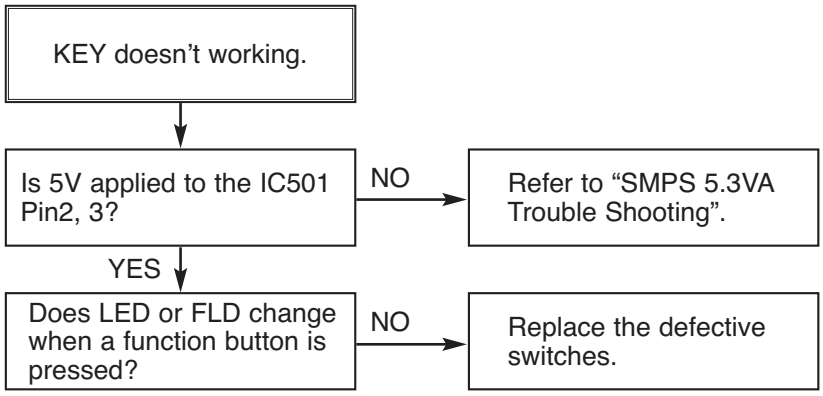
(2) When the Drum Motor doesn't run.


When the Drum Motor doesn't run,
Does 12V appear at the PMC01 Pin8?
NO
Refer to "(2) No 12VA of Power section"
YES
Does 2.8V appear at the PMC01 Pin12?
NO
Do the Drum PWM Pulses appear at the IC501 Pin76?
NO
Do the DFG Pulses appear at the PMC01 Pin11?
YES
NO
Replace the Cap M.
YES
Aren't the foil patterns and the Components between IC501 Pin76 and PMC01 Pin12 short?
YES
Check the connector (PMC01) and the Drum Motor Ass'y.
Do the DFG Pulses appear at the IC501 Pin90?
NO
Aren't the foil patterns and the Components between IC501 Pin 90 and PMC01 Pin11 short?
YES
Do the Drum PWM Pulses appear at the IC501 Pin76?
NO
Replace the IC501.
YES
Aren't the connecting patterns and the Components between IC501 Pin76 and PMC01 Pin12 short?

(3) When the Capstan Motor doesn't run,

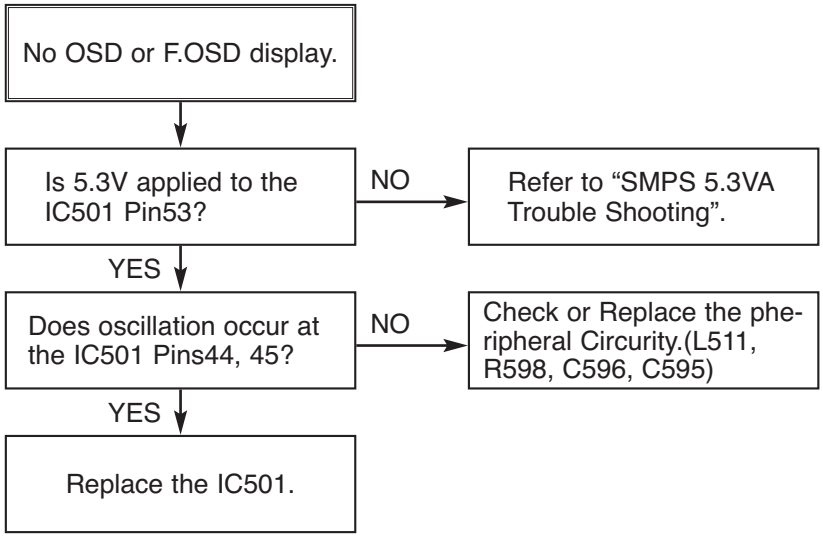

When the Capstan Motor doesn't run,
Does 12VA appear at the PMC01?
NO
Refer to "SMPS(CAPSTAN/12Volt) Trouble Shooting".
YES
Is "DRUM CTL" 2.8V appear at the PMC01?
NO
YES
Check the PMC01 and the Capstan Motor Ass'y.
Does the PWM signal appear at the IC501 Pin77?
YES
NO
Aren't the foil patterns and Components between IC501 Pin77 and PMC01 Pin9 short?
Does the CFG signal appear at the PMC01 Pin1?
YES
NO
Does the CFG signal come into the IC501 Pin87?
Check the Capstan Motor Ass'y.
NO
YES
Does the Capstan PWM signal appear at the IC501 Pin77?
Aren't the foil patterns and component between IC501 Pin87 and PMC01 Pin1 short?
NO
YES
Aren't the foil patterns and Components between IC501 Pin77 and PMC01 Pin9 short?
Replace the IC501.

(4) KEY doesn't working

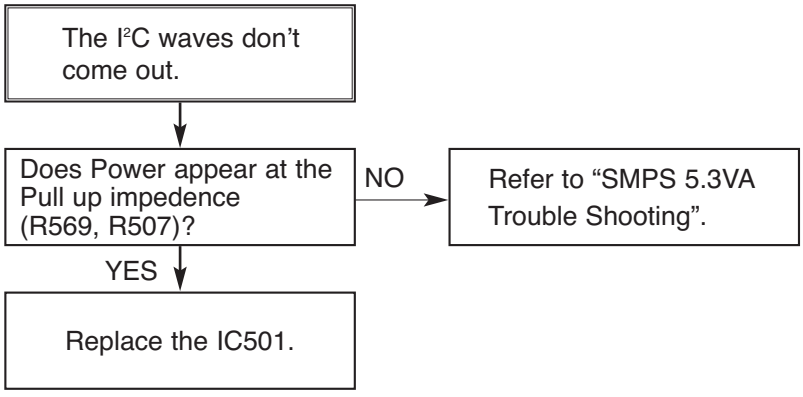

KEY doesn't working.
Is 5V applied to the IC501 Pin2, 3?
NO
Refer to "SMPS 5.3VA Trouble Shooting".
YES
Does LED or FLD change when a function button is pressed?
NO
Replace the defective switches.

4. OSD CIRCUIT

(1) No OSD display.

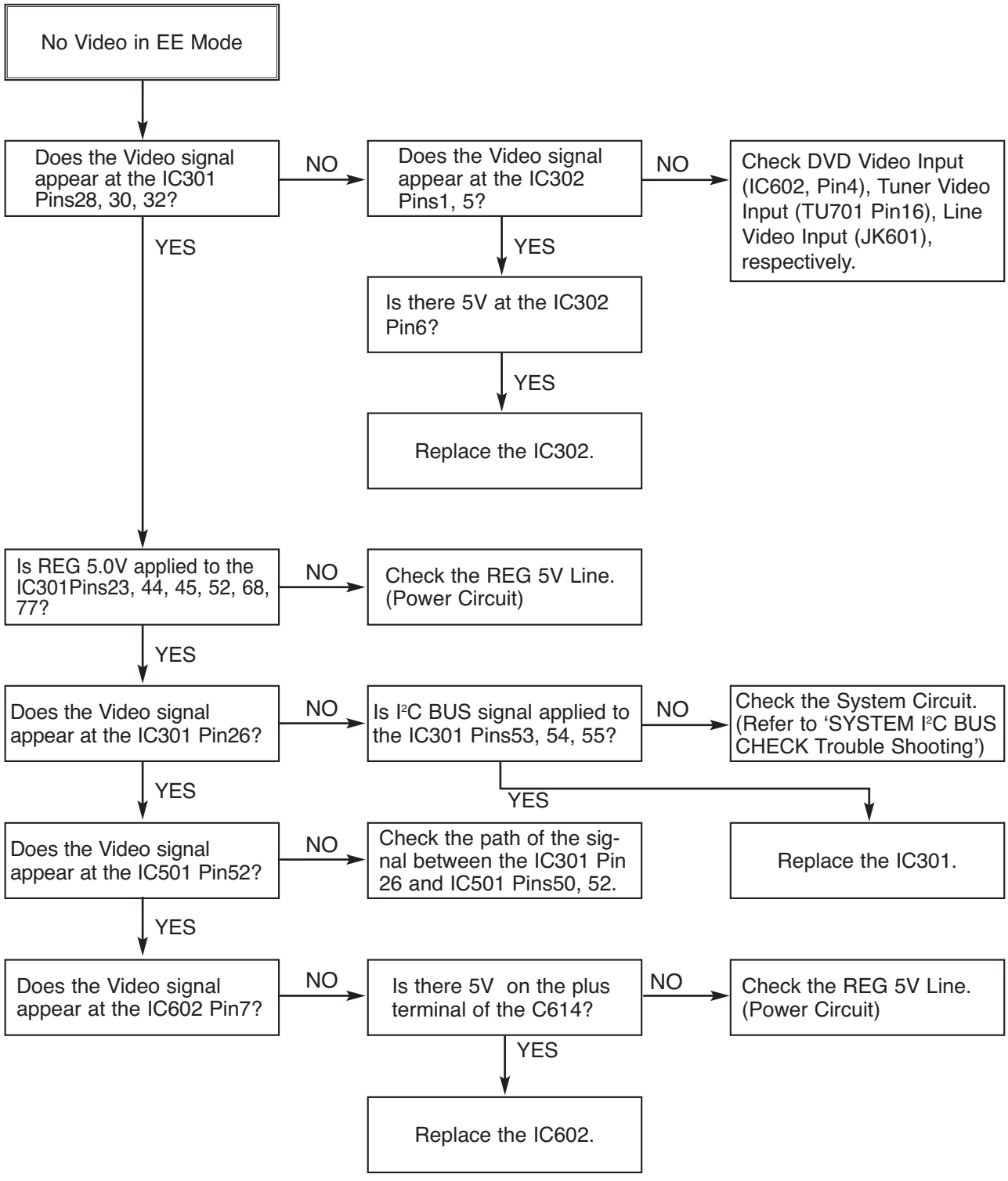

No OSD or F.OSD display.
Is 5.3V applied to the IC501 Pin53?
NO
Refer to "SMPS 5.3VA Trouble Shooting".
YES
Does oscillation occur at the IC501 Pins44, 45?
NO
Check or Replace the pheripheral Circurity.(L511, R598, C596, C595)
YES
Replace the IC501.

(2) I^2C BUS CHECK

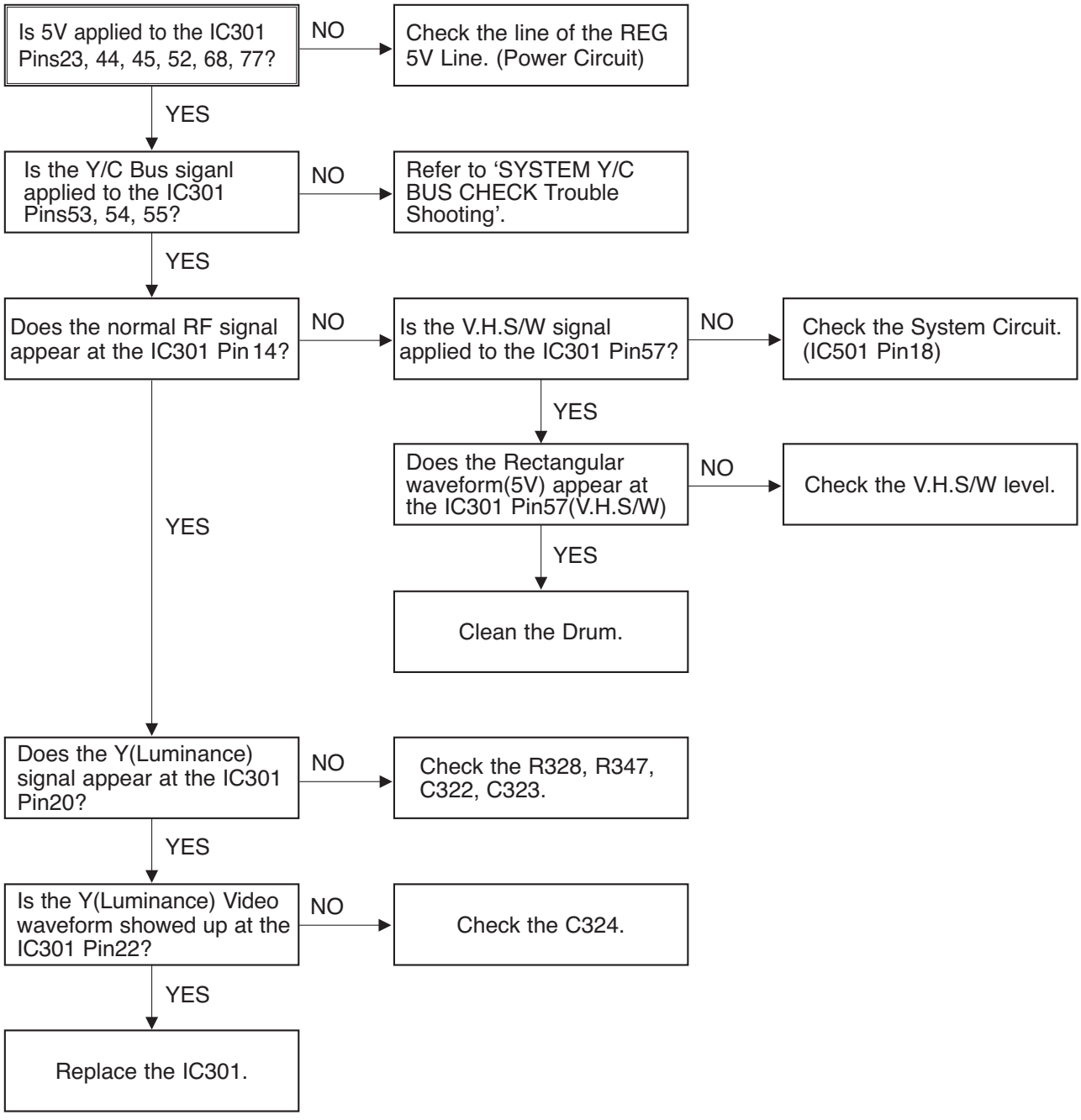

The I²C waves don't come out.
Does Power appear at the Pull up impedence (R569, R507)?
NO
Refer to "SMPS 5.3VA Trouble Shooting".
YES
Replace the IC501.

5. Y/C CIRCUIT

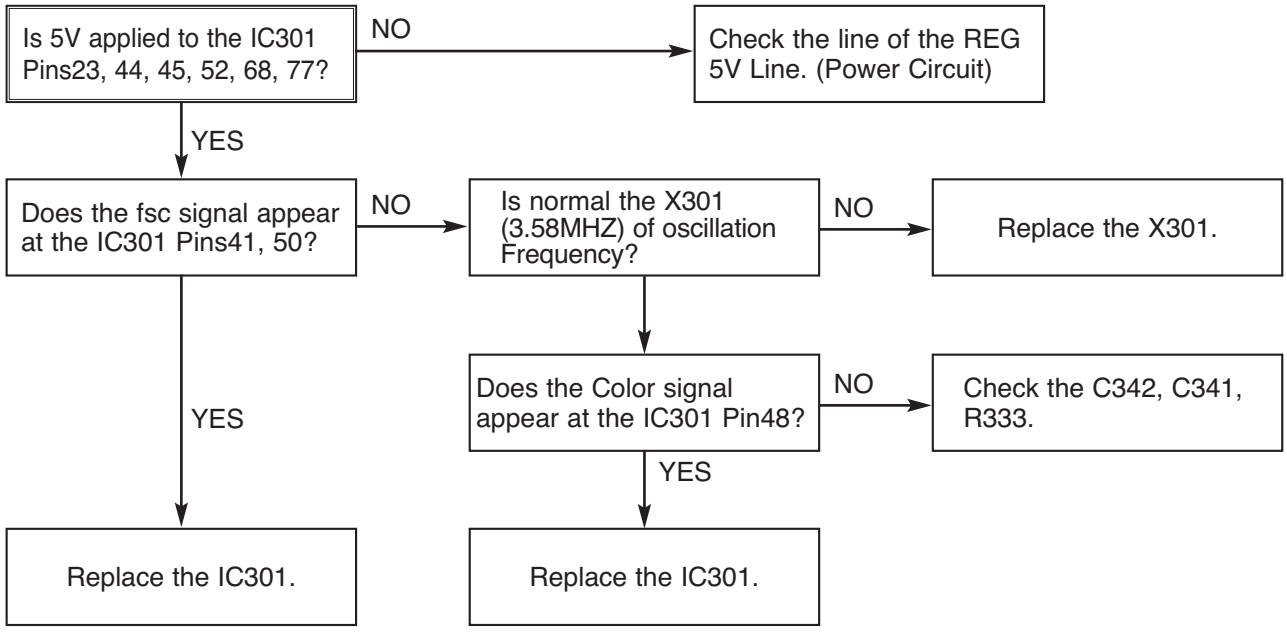
(1) No Video in EE Mode,


No Video in EE Mode
Does the Video signal appear at the IC301 Pins28, 30, 32?
NO
Does the Video signal appear at the IC302 Pins1, 5?
NO
Check DVD Video Input (IC602, Pin4), Tuner Video Input (TU701 Pin16), Line Video Input (JK601), respectively.
YES
YES
Is there 5V at the IC302 Pin6?
YES
Replace the IC302.
Is REG 5.0V applied to the IC301Pins23, 44, 45, 52, 68, 77?
NO
Check the REG 5V Line. (Power Circuit)
YES
Does the Video signal appear at the IC301 Pin26?
NO
Is I²C BUS signal applied to the IC301 Pins53, 54, 55?
NO
Check the System Circuit. (Refer to 'SYSTEM I²C BUS CHECK Trouble Shooting')
YES
YES
Does the Video signal appear at the IC501 Pin52?
NO
Check the path of the signal between the IC301 Pin 26 and IC501 Pins50, 52.
Replace the IC301.
YES
Does the Video signal appear at the IC602 Pin7?
NO
Is there 5V on the plus terminal of the C614?
NO
Check the REG 5V Line. (Power Circuit)
YES
Replace the IC602.

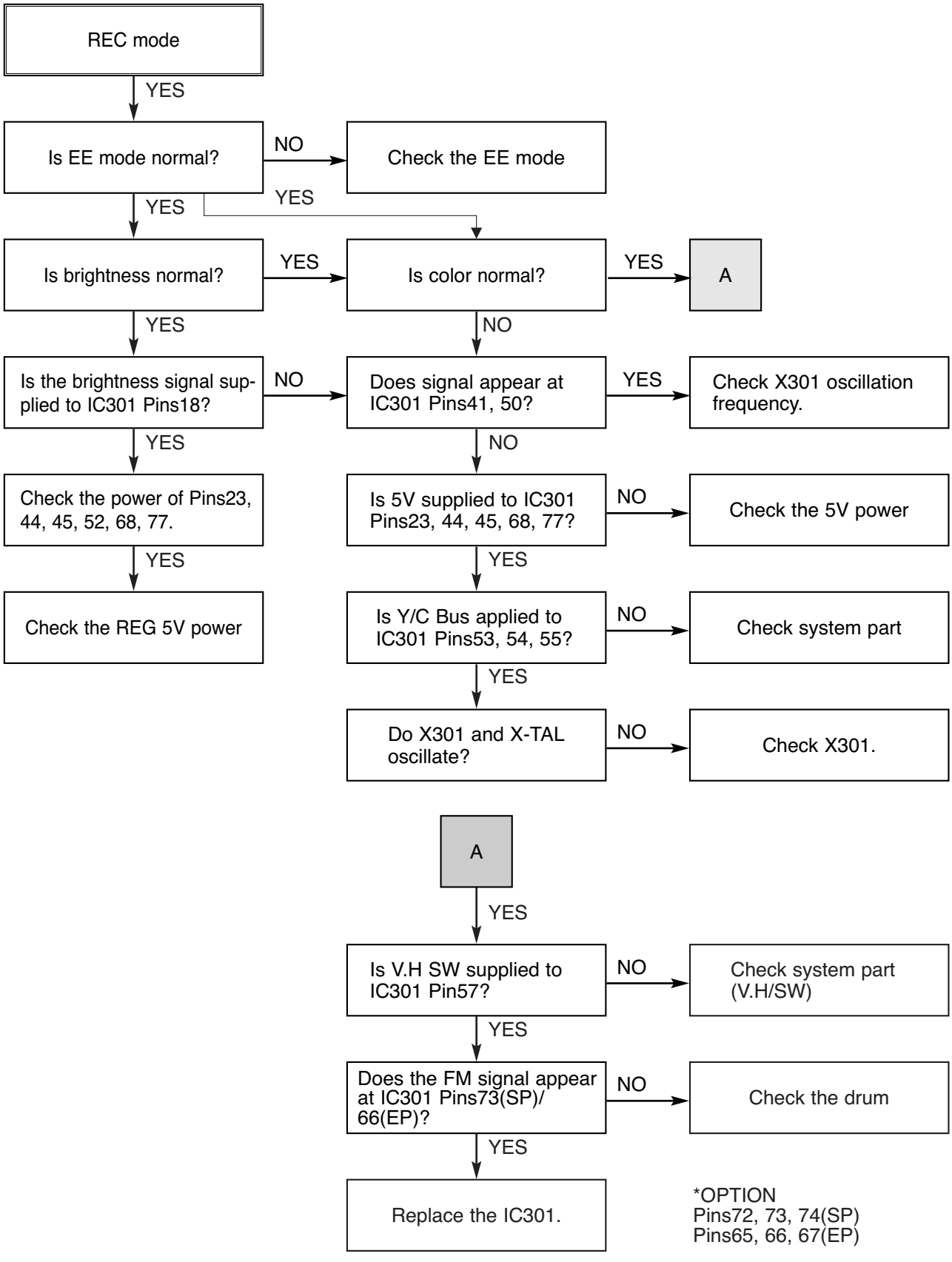
(2) When the Y(Luminance) signal doesn't appear on the screen in PB Mode,


Is 5V applied to the IC301 Pins23, 44, 45, 52, 68, 77?
NO
Check the line of the REG 5V Line. (Power Circuit)
YES
Is the Y/C Bus siganl applied to the IC301 Pins53, 54, 55?
NO
Refer to 'SYSTEM Y/C BUS CHECK Trouble Shooting'.
YES
Does the normal RF signal appear at the IC301 Pin 14?
NO
Is the V.H.S/W signal applied to the IC301 Pin57?
NO
Check the System Circuit. (IC501 Pin18)
YES
Does the Rectangular waveform(5V) appear at the IC301 Pin57(V.H.S/W)
NO
Check the V.H.S/W level.
YES
Clean the Drum.
YES
Does the Y(Luminance) signal appear at the IC301 Pin20?
NO
Check the R328, R347, C322, C323.
YES
Is the Y(Luminance) Video waveform showed up at the IC301 Pin22?
NO
Check the C324.
YES
Replace the IC301.

(3) When the C(Color) signal doesn't appear on the screen in PB Mode,

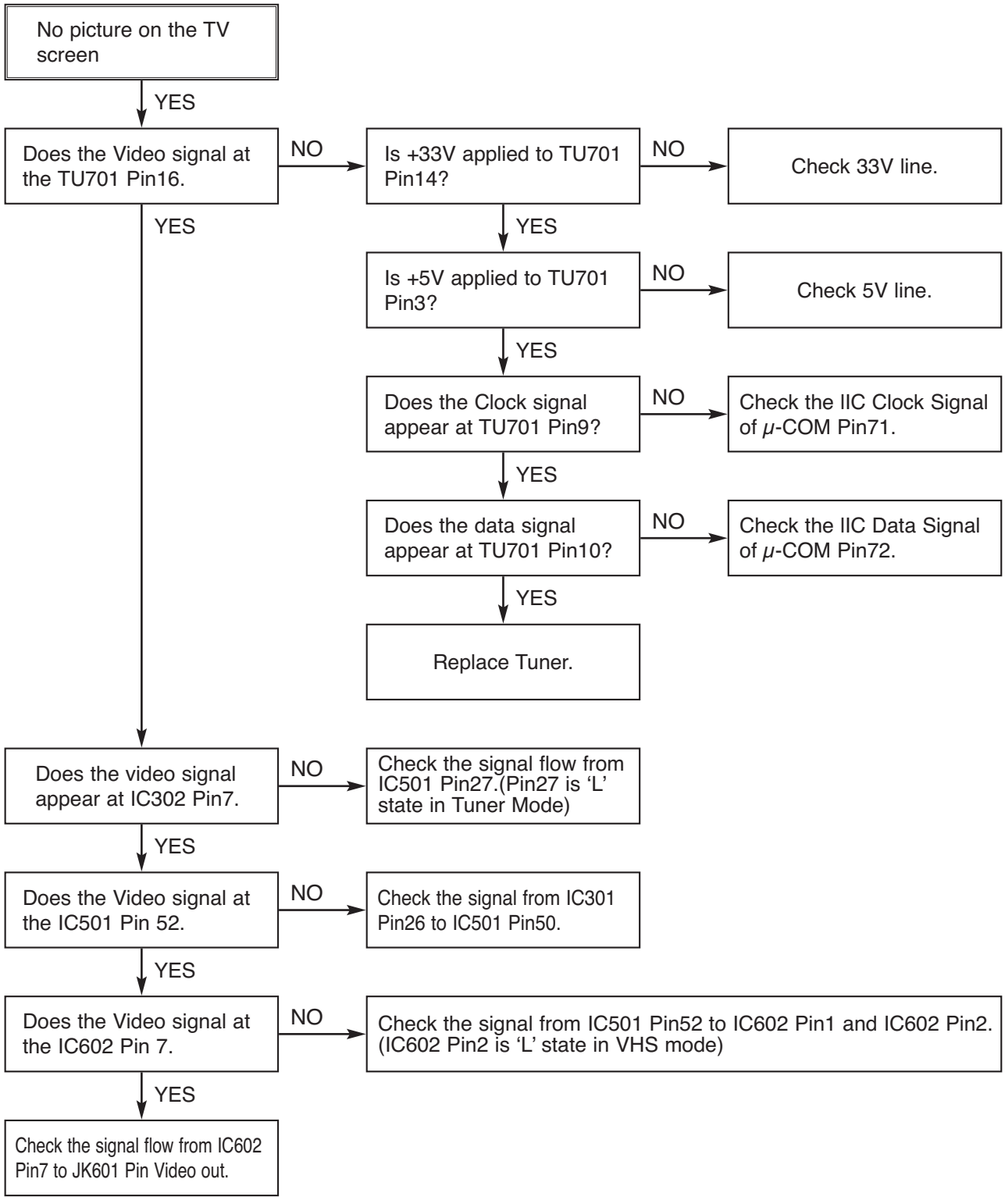

Is 5V applied to the IC301 Pins23, 44, 45, 52, 68, 77?
NO
Check the line of the REG 5V Line. (Power Circuit)
YES
Does the fsc signal appear at the IC301 Pins41, 50?
NO
Is normal the X301 (3.58MHZ) of oscillation Frequency?
NO
Replace the X301.
YES
Does the Color signal appear at the IC301 Pin48?
NO
Check the C342, C341, R333.
YES
Replace the IC301.
Replace the IC301.

(4) When the Video signal doesn't appear on the screen in REC Mode,

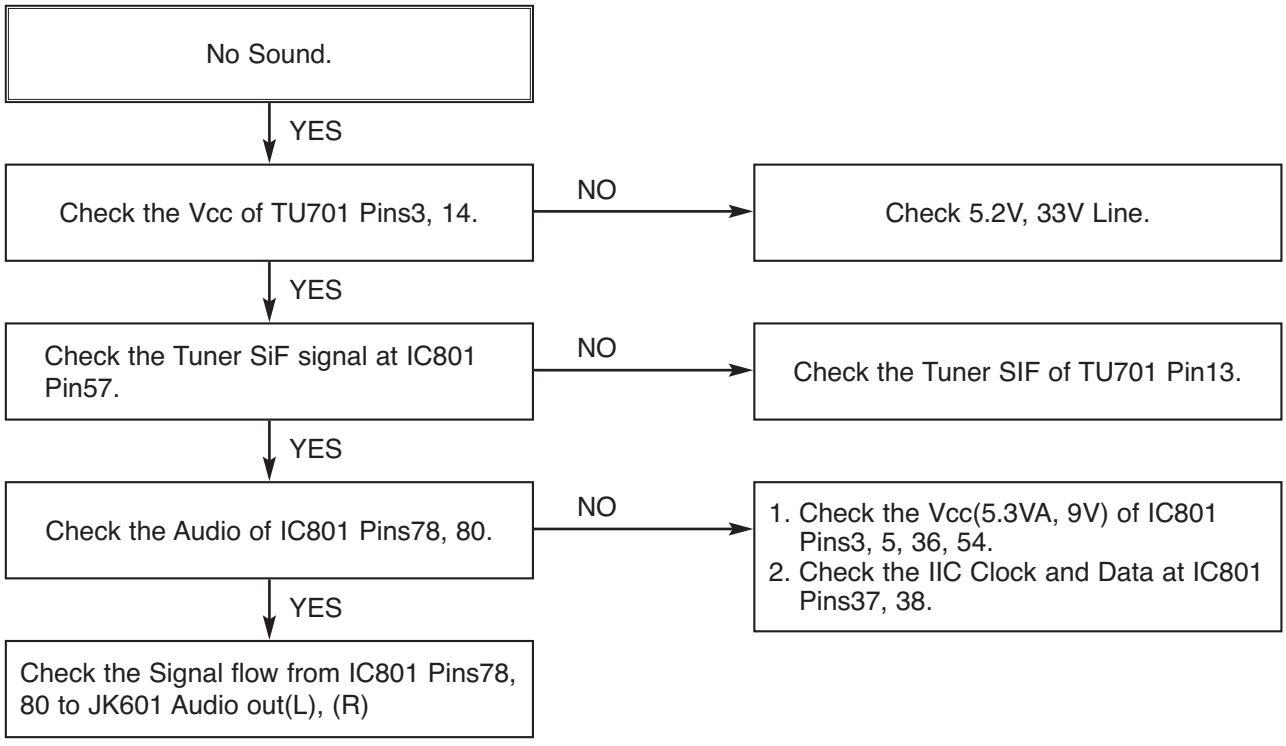


6. Tuner/IF CIRCUIT

(1) No Picture on the TV screen

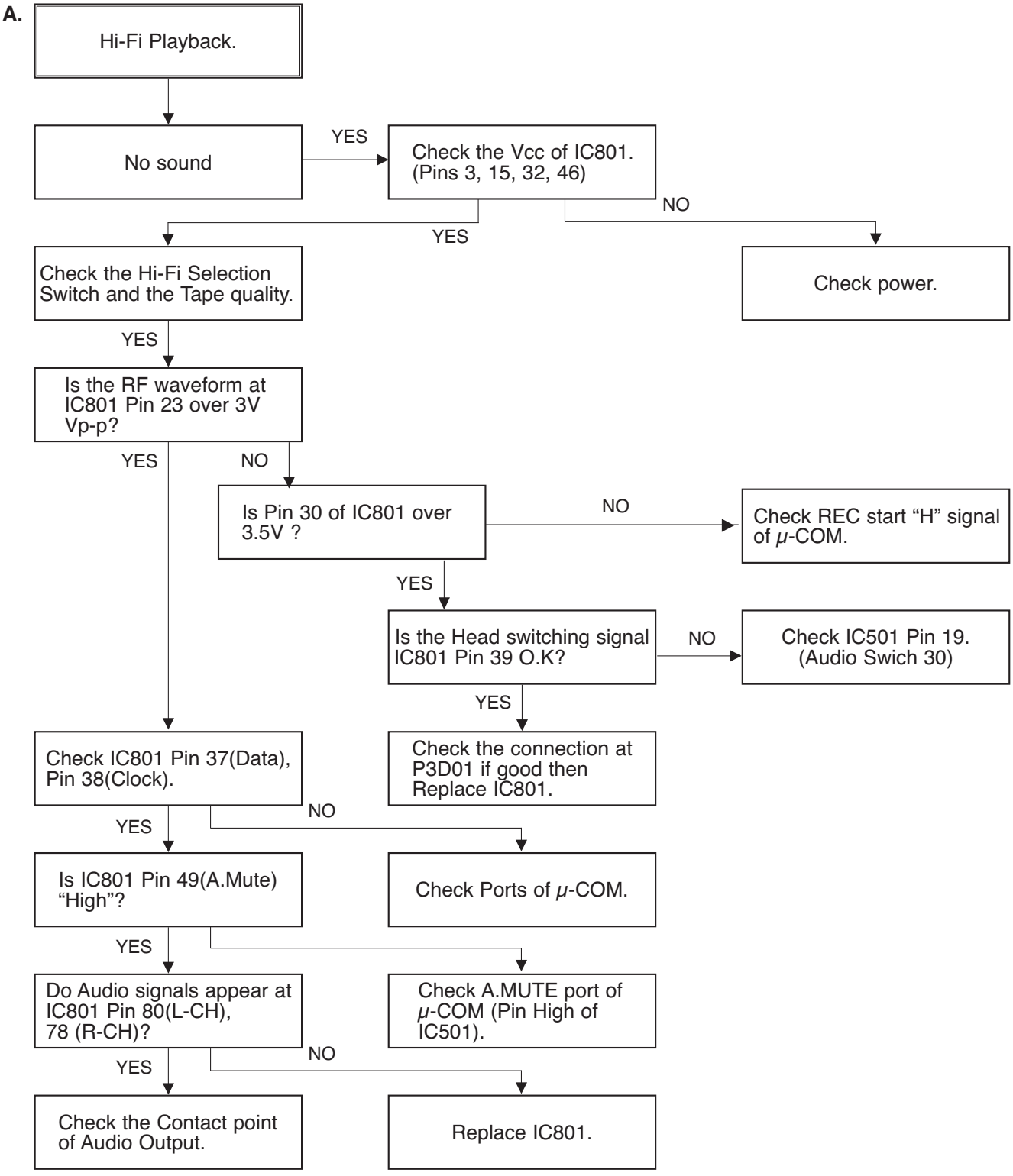

No picture on the TV screen
YES
Does the Video signal at the TU701 Pin16.
NO
Is +33V applied to TU701 Pin14?
NO
Check 33V line.
YES
YES
Is +5V applied to TU701 Pin3?
NO
Check 5V line.
YES
Does the Clock signal appear at TU701 Pin9?
NO
Check the IIC Clock Signal of μ-COM Pin71.
YES
Does the data signal appear at TU701 Pin10?
NO
Check the IIC Data Signal of μ-COM Pin72.
YES
Replace Tuner.
Does the video signal appear at IC302 Pin7.
NO
Check the signal flow from IC501 Pin27.(Pin27 is 'L' state in Tuner Mode)
YES
Does the Video signal at the IC501 Pin 52.
NO
Check the signal from IC301 Pin26 to IC501 Pin50.
YES
Does the Video signal at the IC602 Pin 7.
NO
Check the signal from IC501 Pin52 to IC602 Pin1 and IC602 Pin2. (IC602 Pin2 is 'L' state in VHS mode)
YES
Check the signal flow from IC602 Pin7 to JK601 Pin Video out.

(2) No Sound

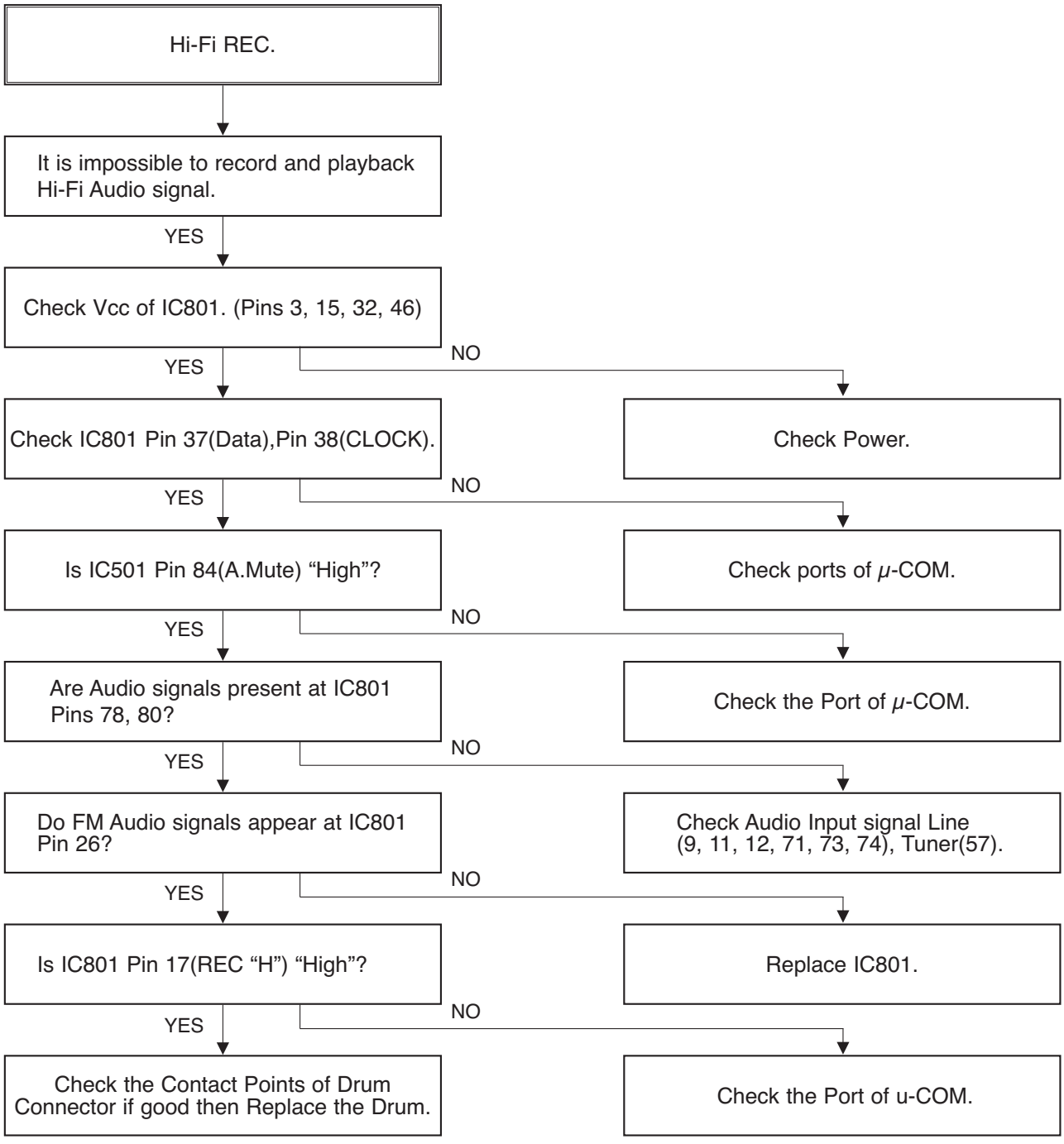

No Sound.
YES
Check the Vcc of TU701 Pins3, 14.
NO
Check 5.2V, 33V Line.
YES
Check the Tuner SiF signal at IC801 Pin57.
NO
Check the Tuner SIF of TU701 Pin13.
YES
Check the Audio of IC801 Pins78, 80.
NO
1. Check the Vcc(5.3VA, 9V) of IC801 Pins3, 5, 36, 54.
2. Check the IIC Clock and Data at IC801 Pins37, 38.
YES
Check the Signal flow from IC801 Pins78, 80 to JK601 Audio out(L), (R)

7. Hi-Fi Circuit

A.


Hi-Fi Playback.
No sound
YES
Check the Vcc of IC801. (Pins 3, 15, 32, 46)
NO
YES
Check power.
Check the Hi-Fi Selection Switch and the Tape quality.
YES
Is the RF waveform at IC801 Pin 23 over 3V Vp-p?
YES
NO
Is Pin 30 of IC801 over 3.5V ?
NO
Check REC start “H” signal of μ-COM.
YES
Is the Head switching signal IC801 Pin 39 O.K?
NO
Check IC501 Pin 19. (Audio Swich 30)
YES
Check IC801 Pin 37(Data), Pin 38(Clock).
Check the connection at P3D01 if good then Replace IC801.
NO
YES
Is IC801 Pin 49(A.Mute) “High”?
Check Ports of μ-COM.
YES
Do Audio signals appear at IC801 Pin 80(L-CH), 78 (R-CH)?
Check A.MUTE port of μ-COM (Pin High of IC501).
NO
YES
Check the Contact point of Audio Output.
Replace IC801.

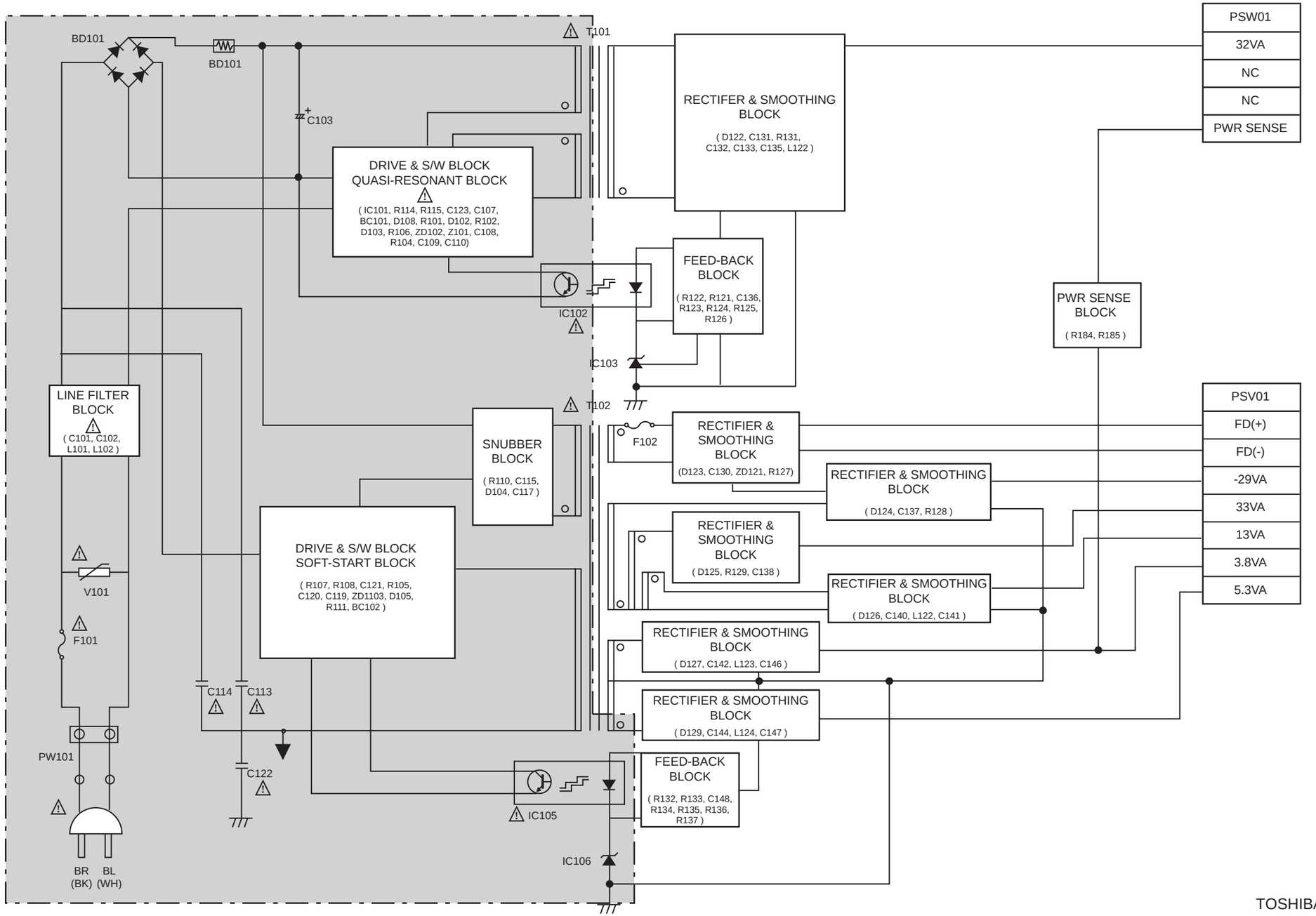
B.


Hi-Fi REC.
It is impossible to record and playback Hi-Fi Audio signal.
YES
Check Vcc of IC801. (Pins 3, 15, 32, 46)
NO
YES
Check Power.
Check IC801 Pin 37(Data),Pin 38(CLOCK).
NO
YES
Check ports of μ-COM.
Is IC501 Pin 84(A.Mute) “High”?
NO
YES
Check the Port of μ-COM.
Are Audio signals present at IC801 Pins 78, 80?
NO
YES
Check Audio Input signal Line (9, 11, 12, 71, 73, 74), Tuner(57).
Do FM Audio signals appear at IC801 Pin 26?
NO
YES
Replace IC801.
Is IC801 Pin 17(REC “H”) “High”?
NO
YES
Check the Port of u-COM.
Check the Contact Points of Drum Connector if good then Replace the Drum.

MEMO

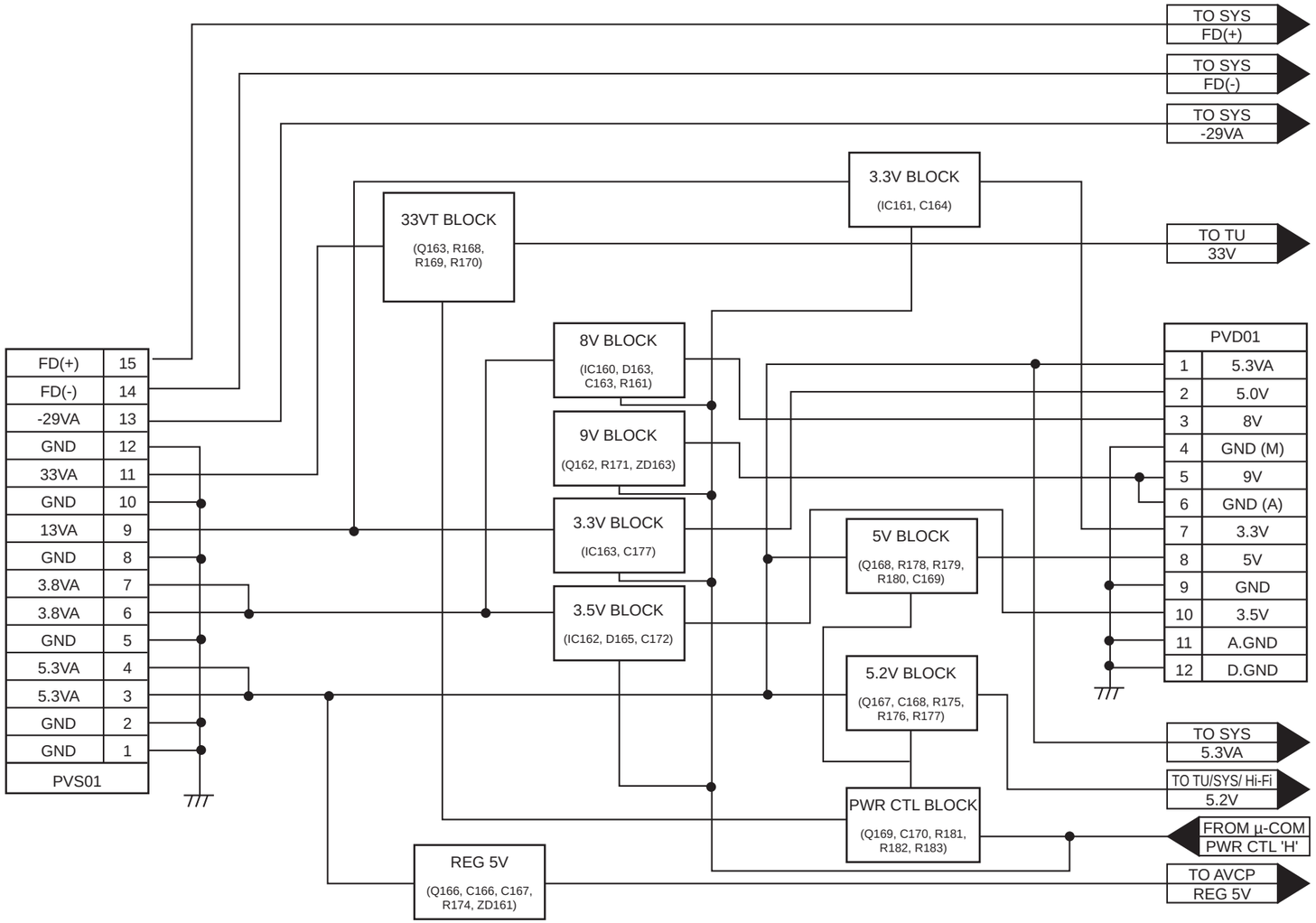
BLOCK DIAGRAMS

1. POWER(SMPS) BLOCK DIAGRAM 1



TOSHIBA
LH-C444M

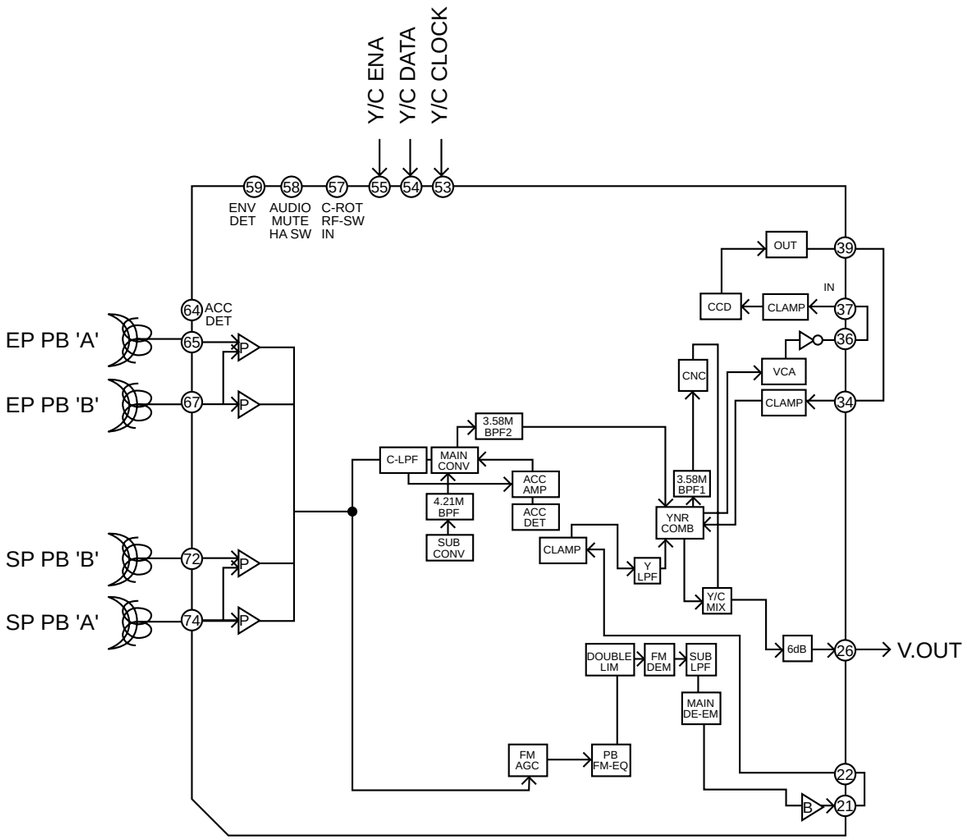
2. POWER(SMPS) BLOCK DIAGRAM 2



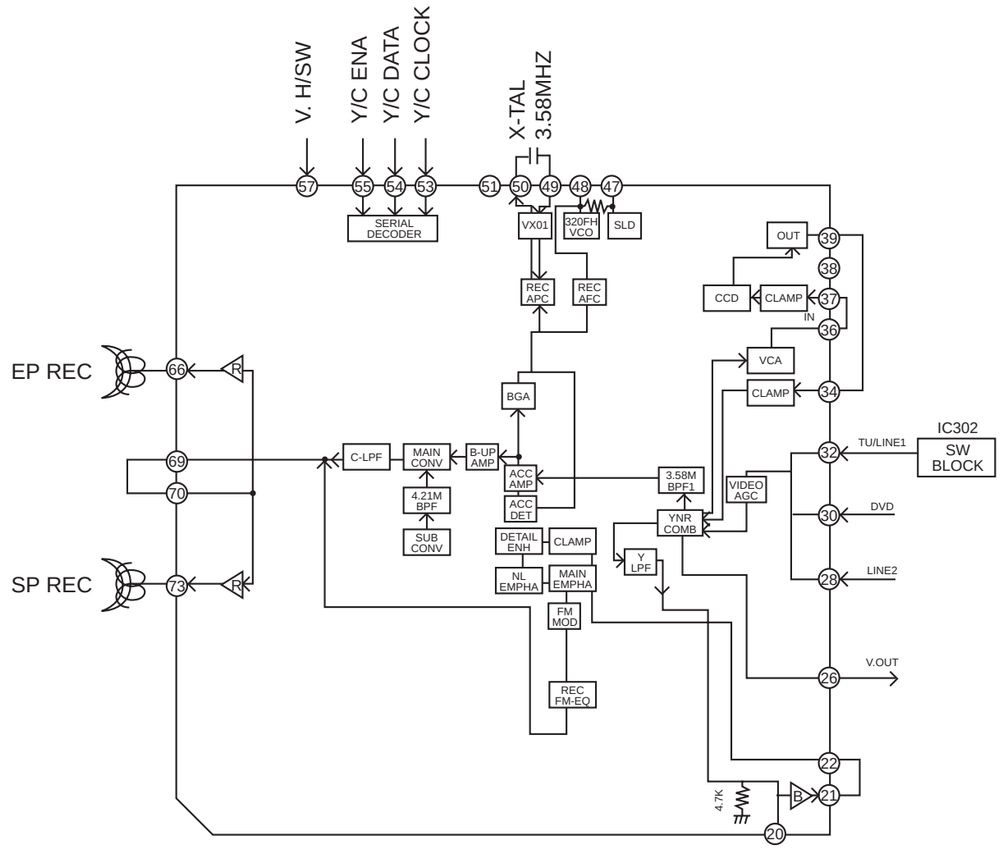
TOSHIBA
LH-C444M

3. Y/C BLOCK DIAGRAM

(PB Mode)



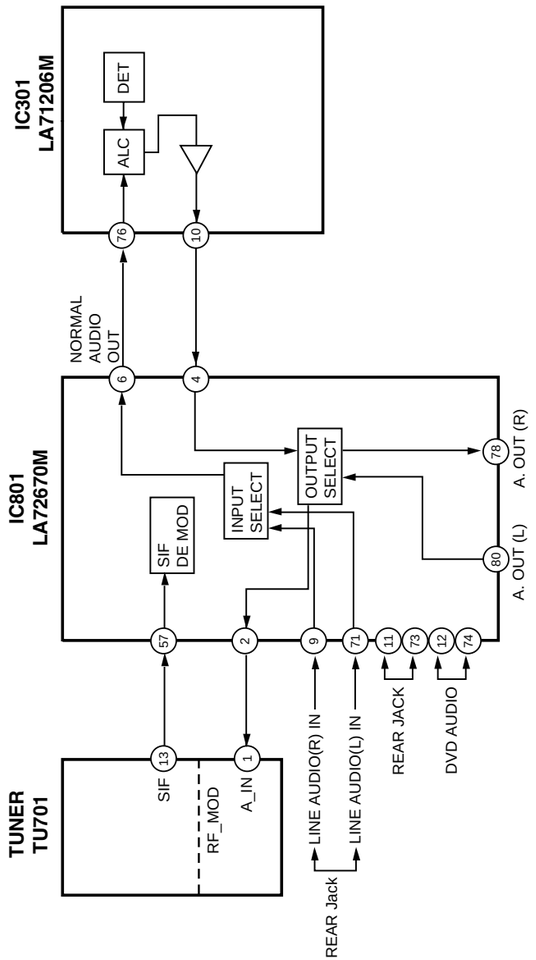
(REC Mode)



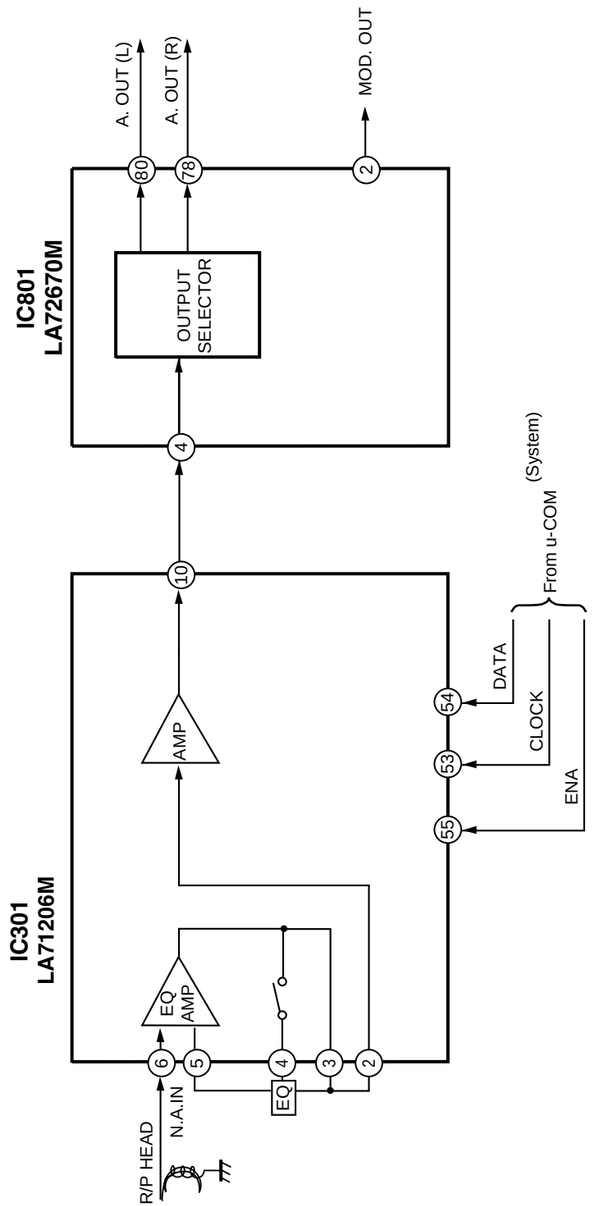
TOSHIBA
LH-C444M

4. NORMAL AUDIO BLOCK DIAGRAM

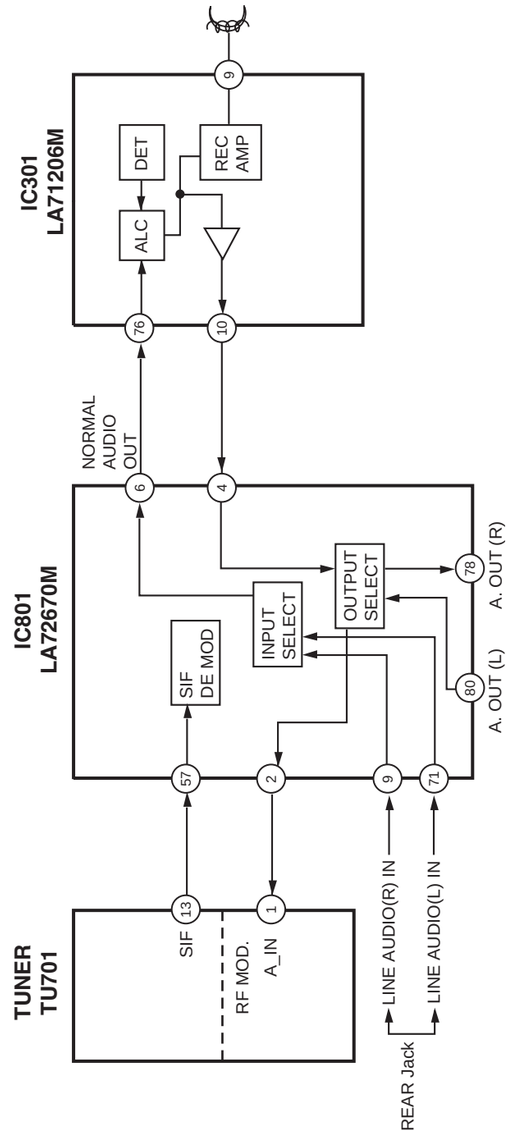
1) EE Mode



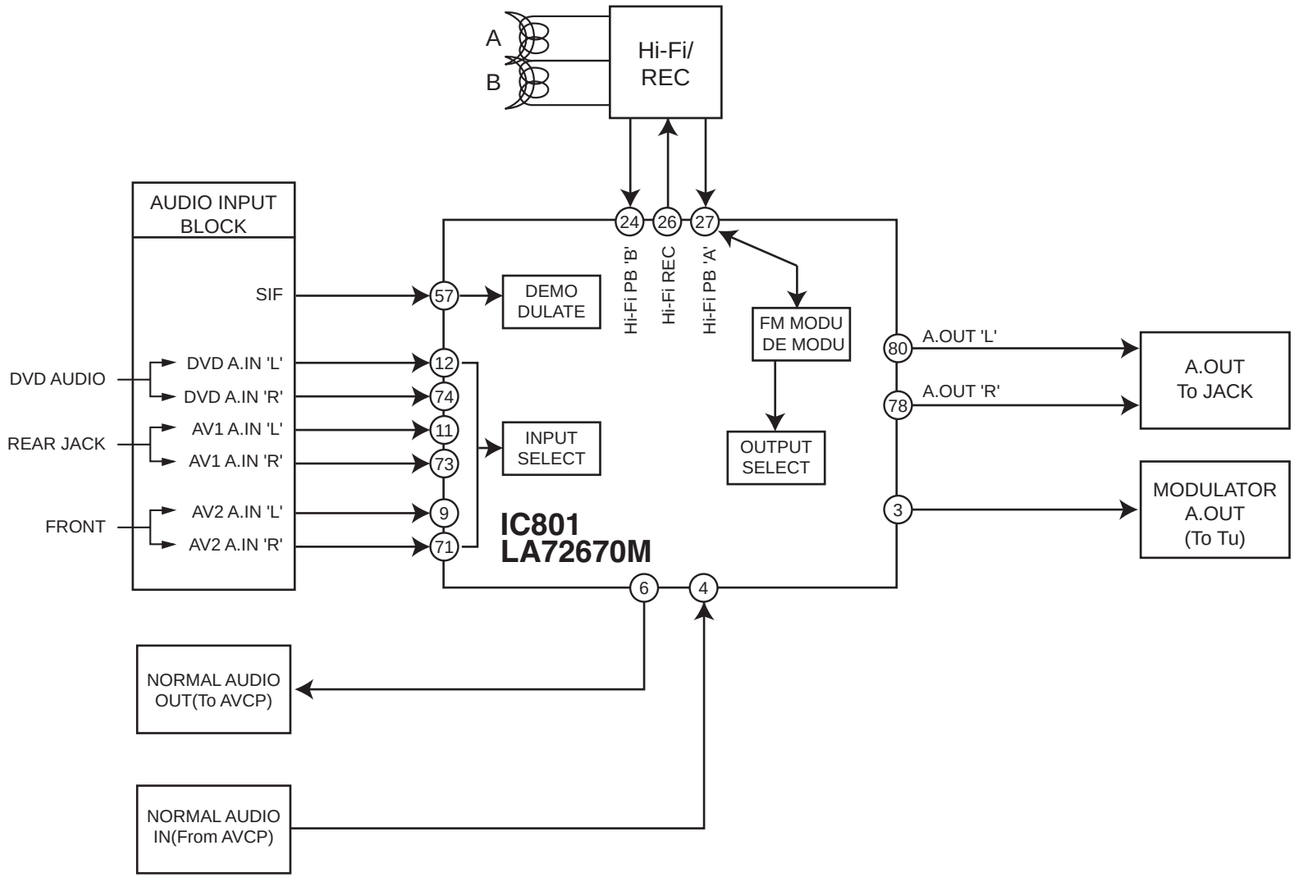
2) PB Mode



3) REC Mode

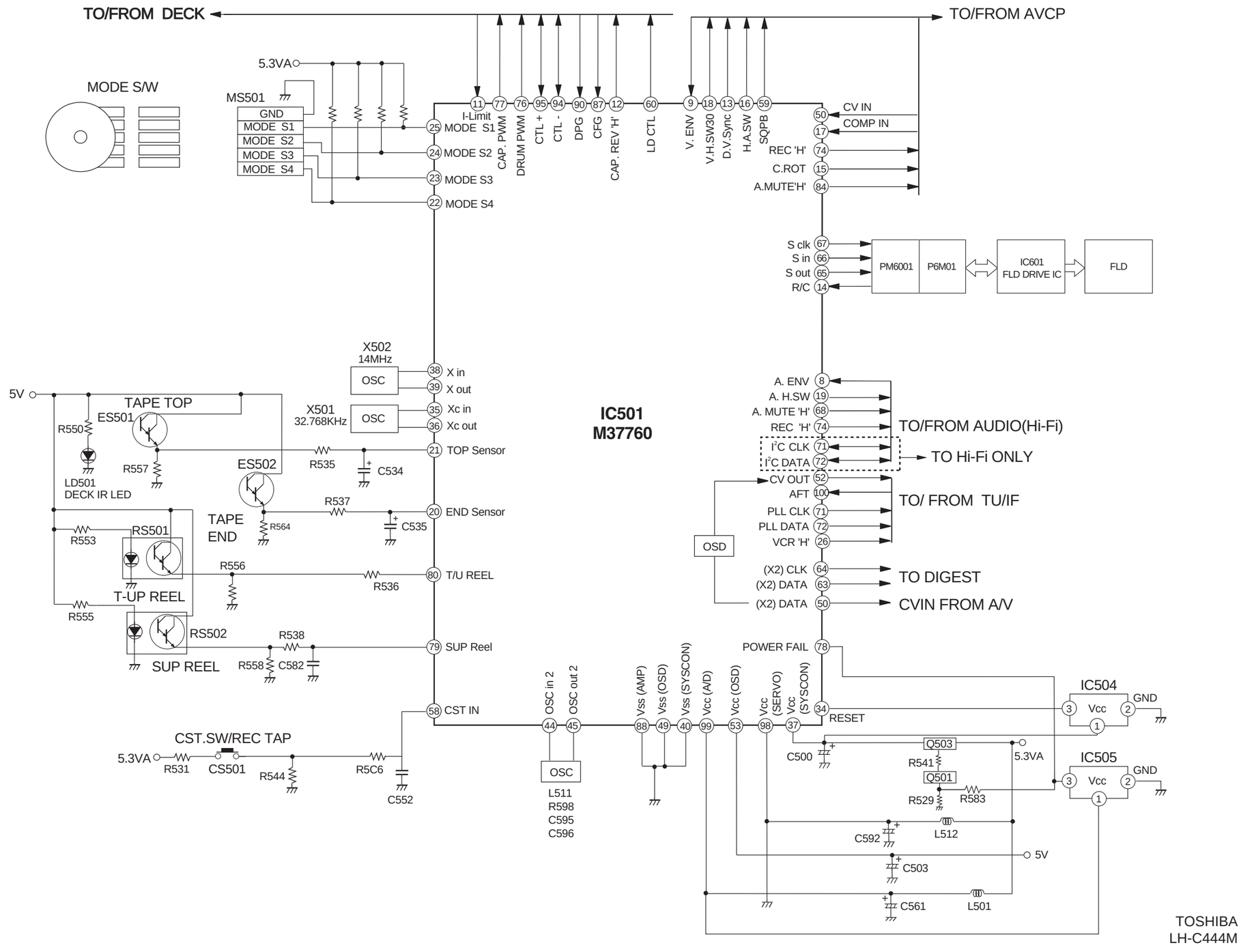


5. Hi-Fi BLOCK DIAGRAM



TOSHIBA
LH-C444M

6. SYSTEM BLOCK DIAGRAM



CIRCUIT DIAGRAMS

1. POWER(SMPS) CIRCUIT DIAGRAM 1

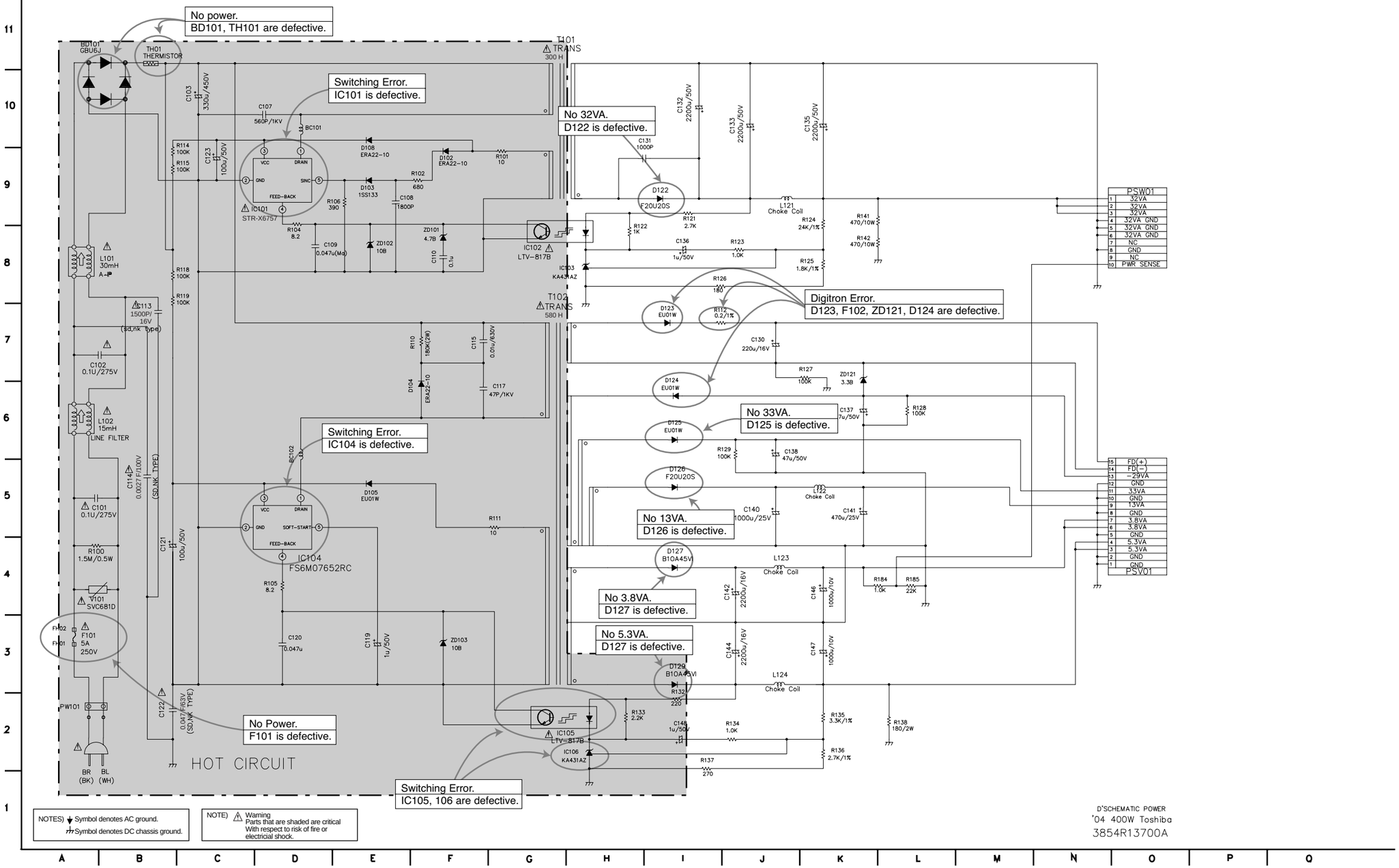
IMPORTANT SAFETY NOTICE

WHEN SERVICING THIS CHASSIS, UNDER NO CIRCUMSTANCES SHOULD THE ORIGINAL DESIGN BE MODIFIED OR ALTERED WITHOUT PERMISSION FROM THE LG ELECTRONICS CORPORATION. ALL COMPONENTS SHOULD BE REPLACED ONLY WITH TYPES IDENTICAL TO THOSE IN THE ORIGINAL CIRCUIT. SPECIAL COMPONENTS ARE SHADED ON THE SCHEMATIC FOR EASY IDENTIFICATION.

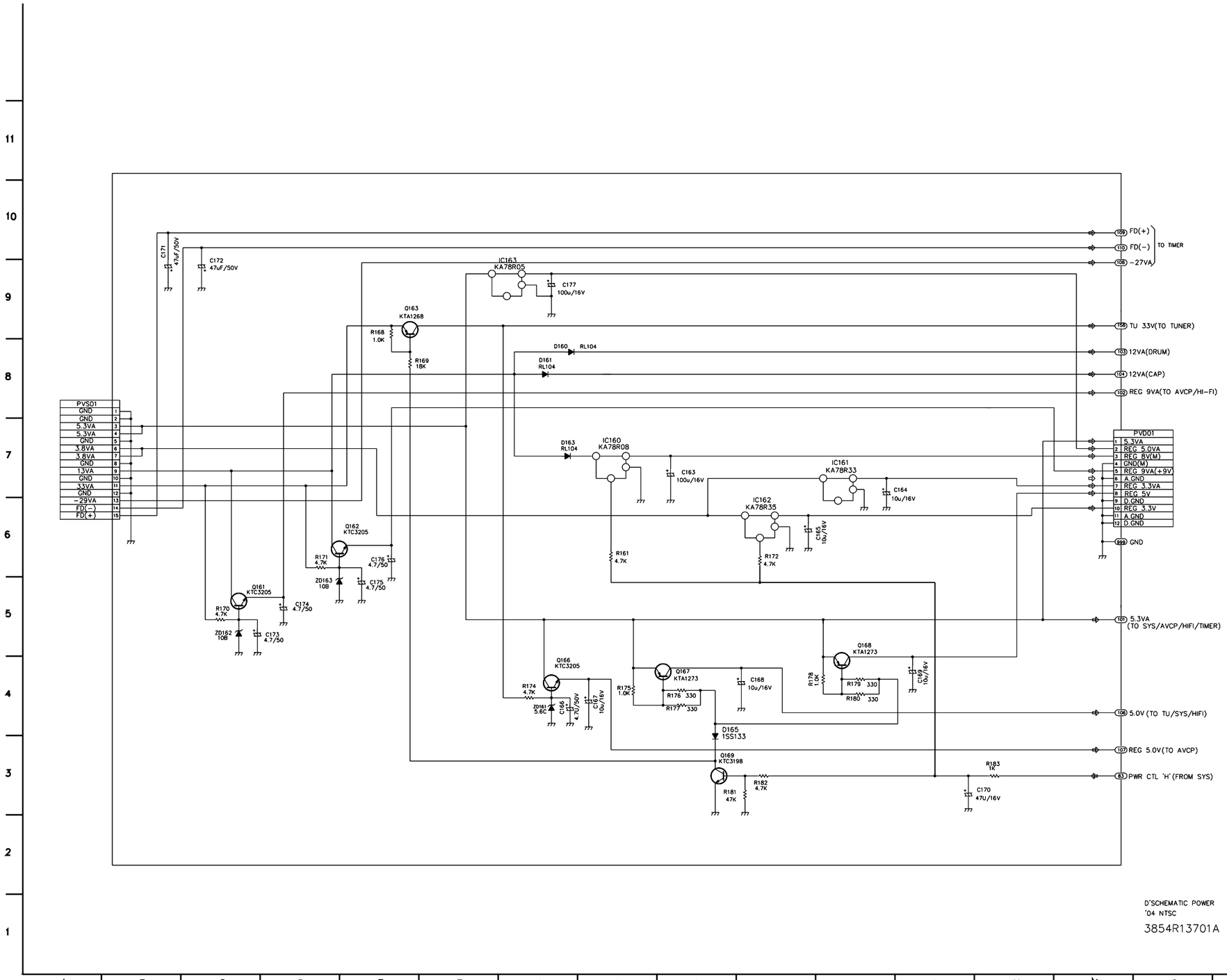
THIS CIRCUIT DIAGRAM MAY OCCASIONALLY DIFFER FROM THE ACTUAL CIRCUIT USED. THIS WAY, IMPLEMENTATION OF THE LATEST SAFETY AND PERFORMANCE IMPROVEMENT CHANGES INTO THE SET IS NOT DELAYED UNTIL THE NEW SERVICE LITERATURE IS PRINTED.

NOTE :

1. Shaded(■) parts are critical for safety. Replace only with specified part number.
2. Voltages are DC-measured with a digital voltmeter during Play mode.

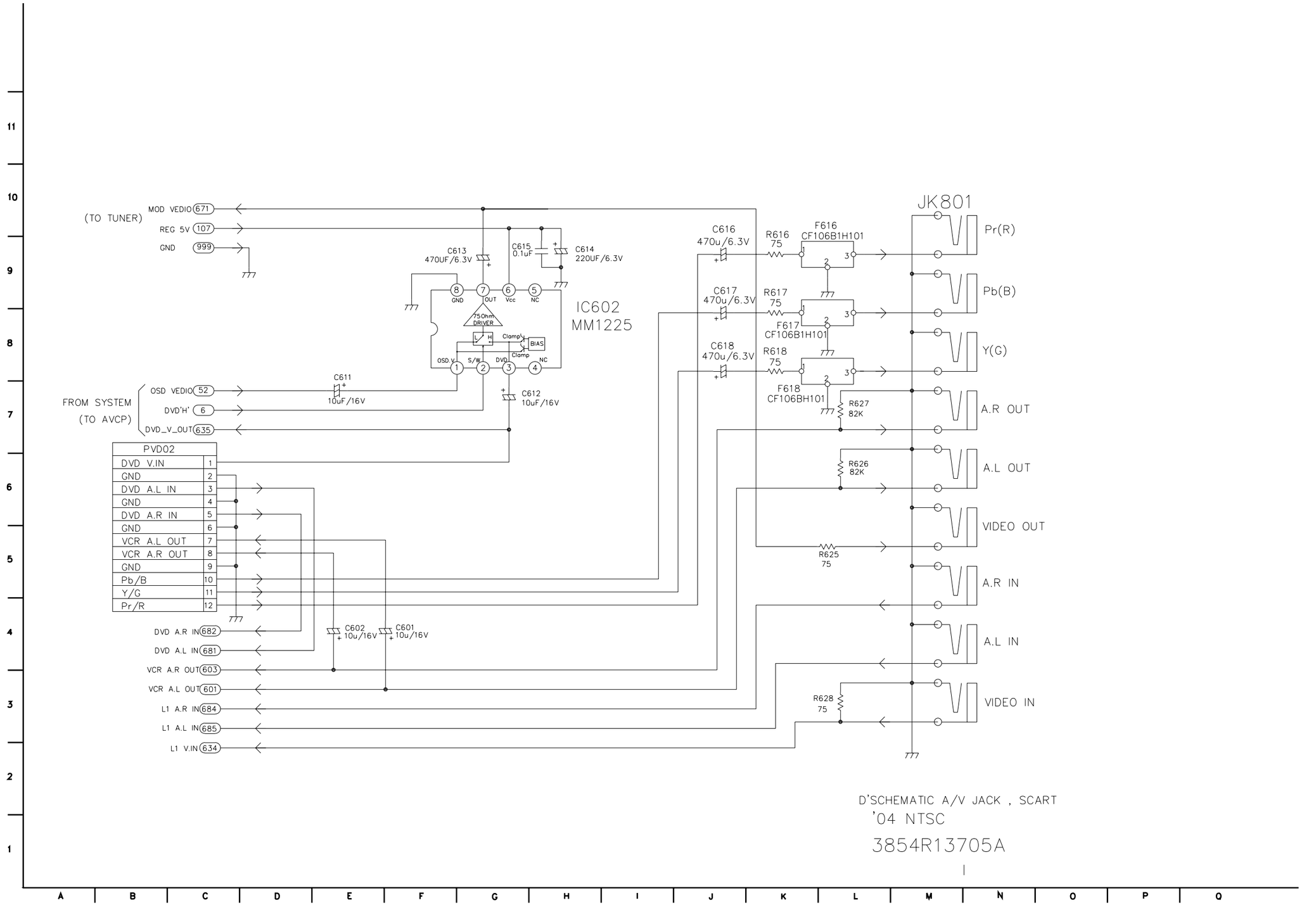


2. POWER(SMPS) CIRCUIT DIAGRAM 2



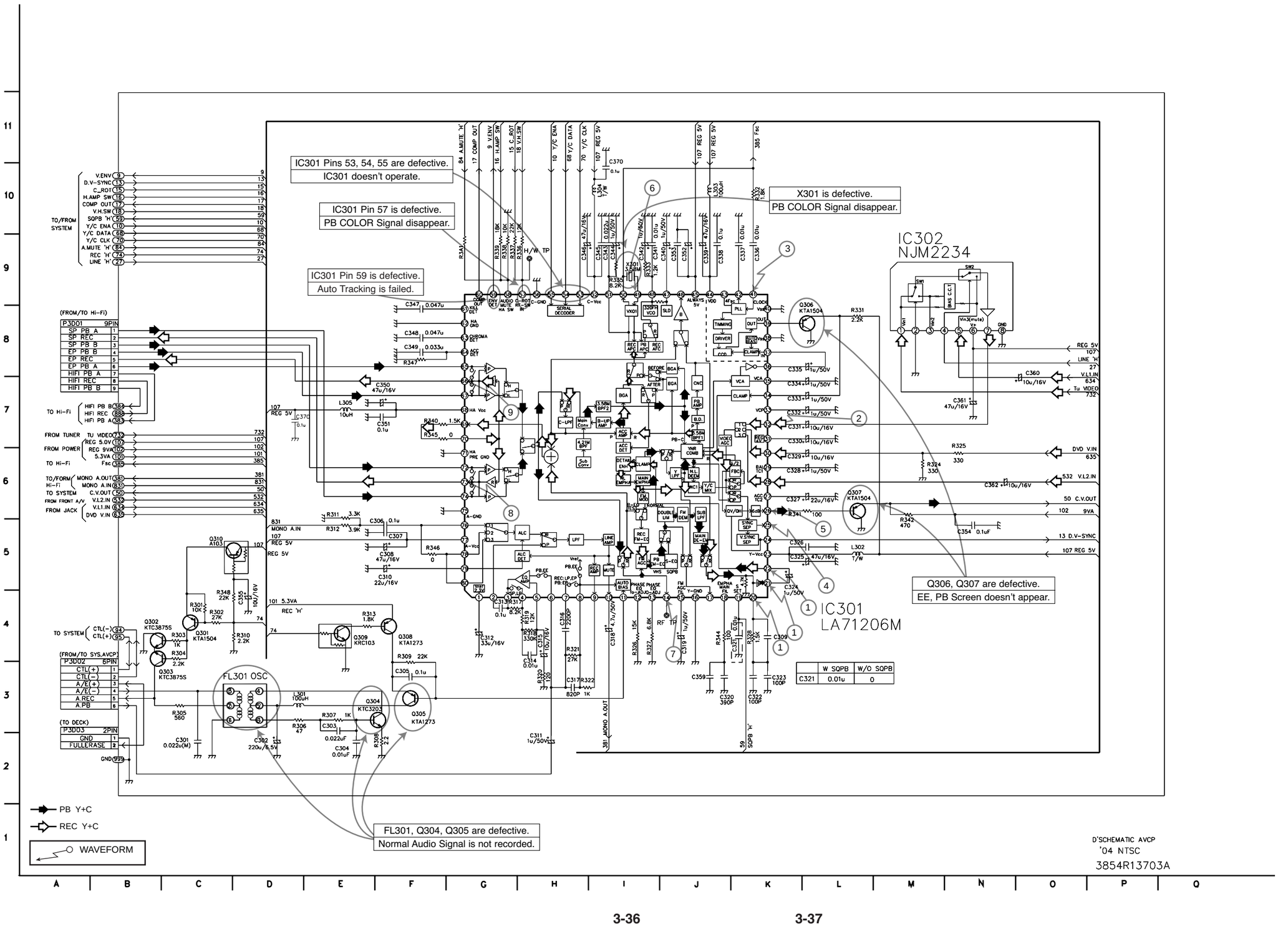
D'SCHEMATIC POWER
'04 NTSC
3854R13701A

3. JACK, TUNER CIRCUIT DIAGRAM

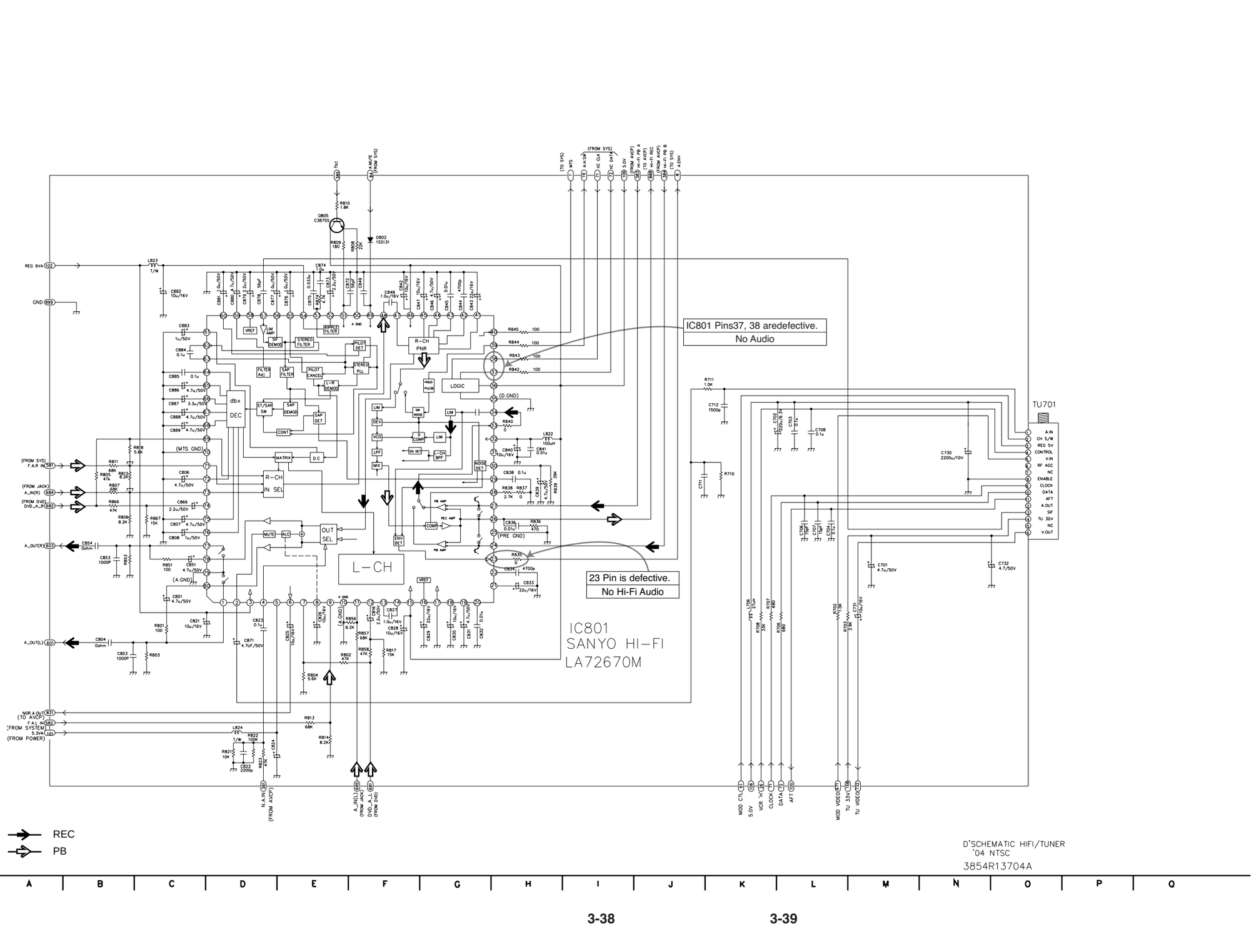


D'SCHEMATIC A/V JACK , SCART
'04 NTSC
3854R13705A

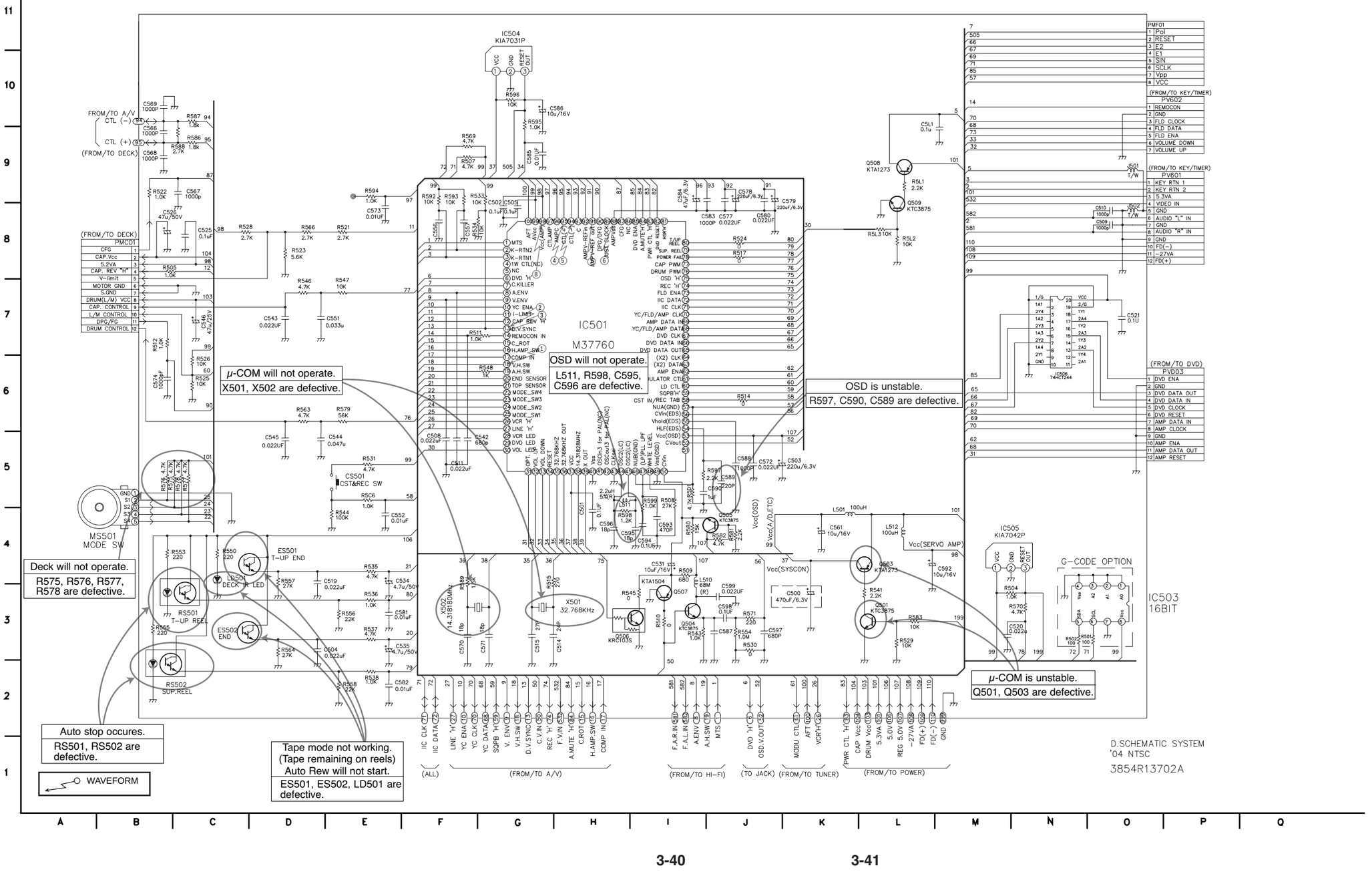
4. A/V CIRCUIT DIAGRAM



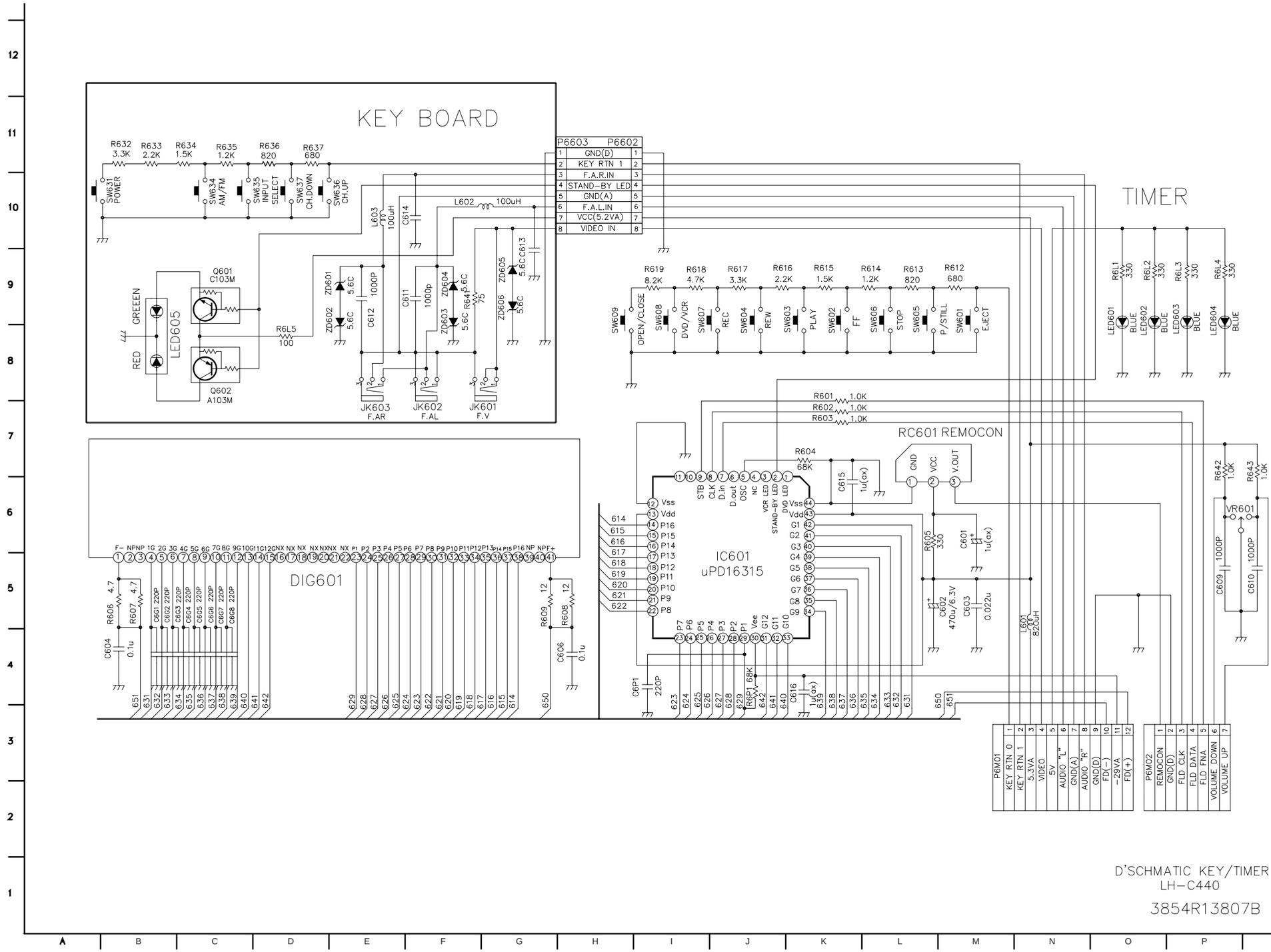
5. Hi-Fi CIRCUIT DIAGRAM



6. SYSTEM CIRCUIT DIAGRAM



7. KEY CIRCUIT DIAGRAM

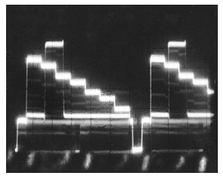


D'SCHMATIC KEY/TIMER
LH-C440

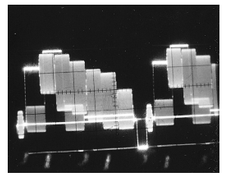
3854R13807B

• WAVEFORMS

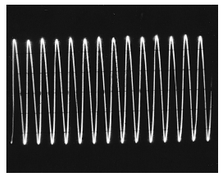
* IC301 Waveform

① 

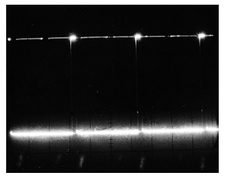
IC301 Pins 20, 21, 22
100mV/10msec DIV
VV/EE
20 Main DE Emphasis Filter
21 Main DE Emphasis out
22 Clamp in

② 

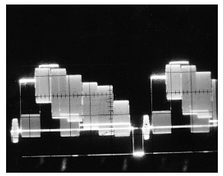
IC301 Pin 32
200mV/10msec DIV
EE
(VIDEO IN)

③ 

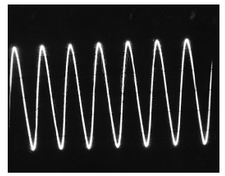
IC301 Pin 41
100mV/0.2msec DIV
REC/PB
(2fsc)

④ 

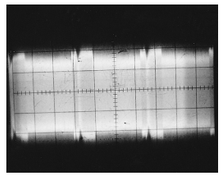
IC301 Pin 25
1.0V/20msec DIV
VV/EE
(C-SYNC OUT)

⑤ 

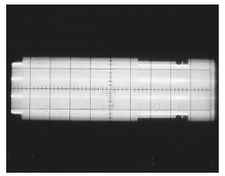
IC301 Pin 26
500mV/10msec DIV
EE
(VIDEO OUT)

⑥ 

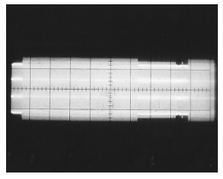
IC301 Pin 49
100mV/0.2msec DIV
PB/REC
(3.58MHz X-TAL IN)

⑦ 

IC301 Pin 14
100mV/5msec DIV
PB
(PB RF out)

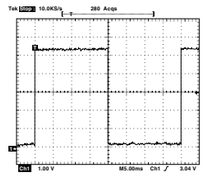
⑧ 

IC301 Pin 73
500mV/2msec DIV
SP REC
(REC RF)

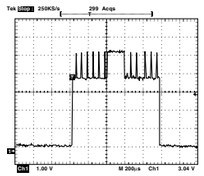
⑨ 

IC301 Pin 66
500mV/2msec DIV
EP REC
(REC RF)

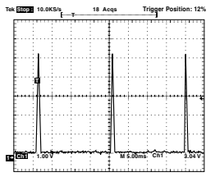
* IC501 Waveform

① 

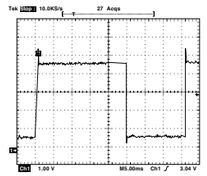
IC501 Pin 18
REC/PB

② 

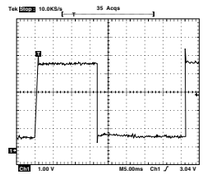
IC501 Pin 13
QUE/REV

③ 

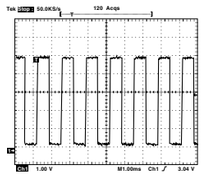
IC501 Pin 13
QUE/REV

④ 

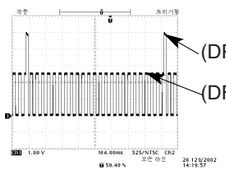
IC501 Pin 95
REC

⑤ 

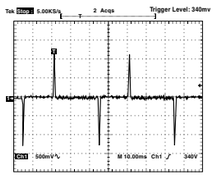
IC501 Pin 94
REC

⑥ 

IC501 Pin 87
REC/PB

⑦ 

IC501 Pin 90
REC/PB
(DPG/DFG)

⑧ 

IC501 Pin 97
PB
(CTL OUT)

• CIRCUIT VOLTAGE CHART

MODE / PIN NO.	EE	PLAY
IC301		
1	2.3	2.31
2	2.29	2.28
3	2.29	2.28
4	2.29	2.28
5	2.31	2.29
6	2.3	2.31
7	0	2.31
8	2.31	2.32
9	2.31	2.31
10	2.25	2.27
11	4.93	4.93
12	1	1
13	0.97	0.97
14	1.92	1.89
15	1.55	1.53
16	0	0
17	2.37	2.55
18	2.39	1.45
19	0	0
20	2.46	2.49
21	1.73	1.79
22	3.07	2.29
23	4.96	4.95
24	0	0
25	0.36	0.35
26	1.83	1.87
27	1.47	1.6
28	2.25	2.56
29	2.32	2.31
30	2.25	2.26
31	4.08	4.08
32	2.25	2.26
33	3.62	2.8
34	2.97	2.93
35	3.13	3.14
36	2.37	2.37
37	2.35	2.29
38	0	0
39	1.82	1.87
40	0	0
41	0.83	0.83
42	2.34	2.37
43	0	0
44	4.92	4.92
45	4.95	4.95
46	2.27	3.17
47	3.31	3.31
48	3.32	3.32
49	3.94	3.94
50	2.54	2.55
51	2.12	2.09
52	4.95	4.95
53	4.75	4.62
54	4.7	4.52

MODE / PIN NO.	EE	PLAY
55	0.68	0.93
56	0	0
57	0	2.56
58	0	1.61
59	0	2.9
60	4.91	0.94
61	2.92	1.94
62	0	0
63	3.96	3.98
64	1.76	1.72
65	1.84	1.85
66	1.84	1.86
67	1.84	1.86
68	4.93	4.93
69	0.18	0
70	0.15	0
71	0	0
72	1.82	0.71
73	1.82	0.71
74	1.82	0.71
75	0	0
76	2.3	2.3
77	4.96	4.96
78	2.3	2.3
79	0	0
80	2.3	2.3
IC302		
1	2.96	2.96
2	0	0
3	3.01	3
4	5.12	5.12
5	2.95	2.95
6	4.97	4.97
7	2.2	2.2
8	0	0
IC501		
1	0.97	0
2	5.17	5.17
3	5.17	5.16
4	0	0
5	0.5	0.54
6	0	0
7	0.4	0.42
8	0.19	4.06
9	0.29	3.91
10	0.68	0.99
11	0	3.42
12	0	0
13	0	0
14	4.78	4.78
15	0	2.57
16	0	0
17	0.68	0.43
18	2.56	2.57
19	2.57	2.57

MODE / PIN NO.	EE	PLAY
20	0	0
21	0.11	0.11
22	5.17	5.17
23	]5.17	5.17
24	5.17	5.17
25	0	0
26	5.13	5.13
27	5.13	5.17
28	5.13	5.13
29	0	0
30	0	0
31	0	0
32	0	0
33	0	0
34	5.15	5.15
35	1.52	1.51
36	1.43	1.44
37	5.15	5.15
38	2.19	2.18
39	2.28	2.27
40	0	0
41	0.51	0.55
42	0.26	0.55
43	0.26	0
44	2.35	2.34
45	2.41	2.41
46	0	0
47	1.29	0
48	0	0
49	0	0
50	1.88	1.99
51	0.53	0.57
52	1.88	1.98
53	4.96	4.95
54	2.03	2.03
55	2.6	1.92
56	1.96	2.05
57	0	0
58	0	0
59	0	0
60	2.57	2.58
61	0	4.28
62	0	0
63	0	0
64	0	0
65	0.97	0.86
66	2.38	0
67	5.07	5.07
68	4.7	4.45
69	5.02	4.97
70	4.75	4.61
71	5.17	5.17
72	5.17	5.17
73	0	0
74	0	0

MODE / PIN NO.	EE	PLAY
75	0	0
76	0	1.79
77	0	2.72
78	0	4.76
79	0	0
80	0	0
81	0	0
82	4.94	4.94
83	5.03	4.98
84	0	0
85	2.69	2.67
86	0.58	0.68
87	0.17	2.36
88	0	0
89	0.54	0
90	0.1	1.36
91	2.53	2.54
92	2.54	2.53
93	0.21	0
94	2.5	2.49
95	2.5	2.49
96	2.52	2.52
97	2.52	2.52
98	5.08	5.08
99	5.17	5.17
100	2.64	1.95
IC504		
1	5.19	5.19
2	0	0
3	5.14	5.14
IC505		
1	5.19	5.19
2	0	0
3	4.7	4.7
IC601		
1	1.93	1.93
2	2.01	2.01
3	5.05	5.05
4	1.7	1.7
5	0	0
6	5.05	5.05
IC602		
1	2.51	2
2	0	0
3	2.27	2.35
4	0	0
5	0	0
6	5.06	5.06
7	2.53	2.04
8	0	0
IC801		
1	0	0
2	2.56	2.54
3	9.21	9.18
4	2.48	2.48

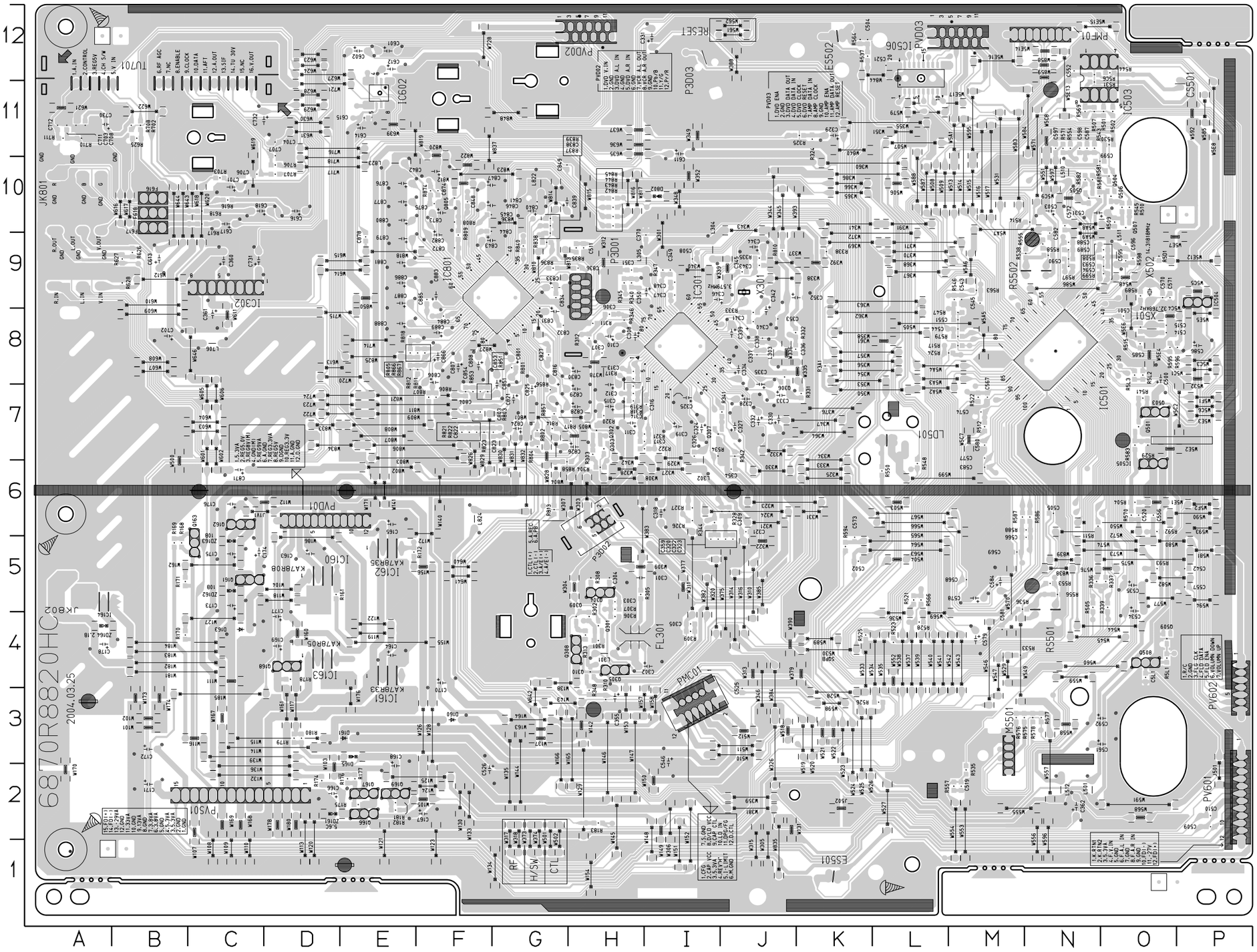
MODE / PIN NO.	EE	PLAY
5	5.19	5.19
6	1.91	2.07
7	0	0
8	0.29	1.31
9	0	0
10	0	0
11	0	0
12	2.5	2.5
13	1.91	2.44
14	2.49	2.49
15	5.06	5.05
16	2.51	2.51
17	0	0
18	0	0.86
19	2.51	2.44
20	2.52	2.45
21	2.52	2.43
22	2.51	2.42
23	0.19	3.66
24	2.25	2.3
25	0	0
26	2.24	2.3
27	2.25	2.3
28	0	0
29	2.48	0.11
30	0	1.34
31	2.51	3.79
32	5.02	5.01
33	2.64	2.65
34	2.64	2.64
35	0	0
36	5.06	5.05
37	5.17	5.05
38	5.17	5.17
39	0	2.57
40	0.19	0
41	2.52	2.45
42	2.51	2.43
43	2.52	2.45
44	2.52	2.45
45	0	0.25
46	5.06	5.05
47	2.49	2.49
48	1.9	2.42
49	0	0
50	0	0
51	2.05	2.06
52	1.22	0
53	3.86	0.25
54	9.2	9.19
55	6.26	0.28
56	1.96	0.29
57	2.2	2.15
58	4.56	0
59	2.52	2.35

MODE / PIN NO.	EE	PLAY
60	3.86	0.23
61	3.15	0.24
62	4.02	0
63	3.83	0
64	2.45	0
65	3.87	0.32
66	4.09	0.32
67	3.88	0.31
68	3.94	0.31
69	0	0
70	0	0
71	0	0
72	3.86	0.31
73	0	0
74	2.5	2.5
75	3.87	0.4
76	3.17	0.22
77	0	0
78	4.42	4.3
79	0	0
80	4.4	4.3

Location No.	Base		Emitter		Collector	
	EE	PB	EE	PB	EE	PB
Q301	4.26	4.26	4.97	4.96	4.907	4.91
Q302	0.758	1.74	0	0	0	0
Q303	0.734	0.72	0	0	0	0
Q304	0	0	0	0	0	0
Q305	4.92	4.92	4.94	4.93	0	0
Q306	1.828	1.86	2.45	2.5	0	0
Q307	1.843	2.05	2.51	2.62	0	0
Q308	5.19	5.19	4.87	4.91	4.93	4.92
Q309	0	0	0	0	4.91	4.97
Q501	0.68	0.68	0	0	0	0
Q503	5.17	5.17	4.48	4.48	5.15	5.15
Q504	2.82	2.94	2.18	2.27	4.95	4.95
Q505	1.58	1.58	1.03	2.24	4.96	4.96
Q506	5.07	0	0	0	0	3.29
Q507	2.8	2.6	0	3.23	0	0
Q805	2.56	2.56	2.08	2.08	5.06	5.05

PRINTED CIRCUIT DIAGRAMS

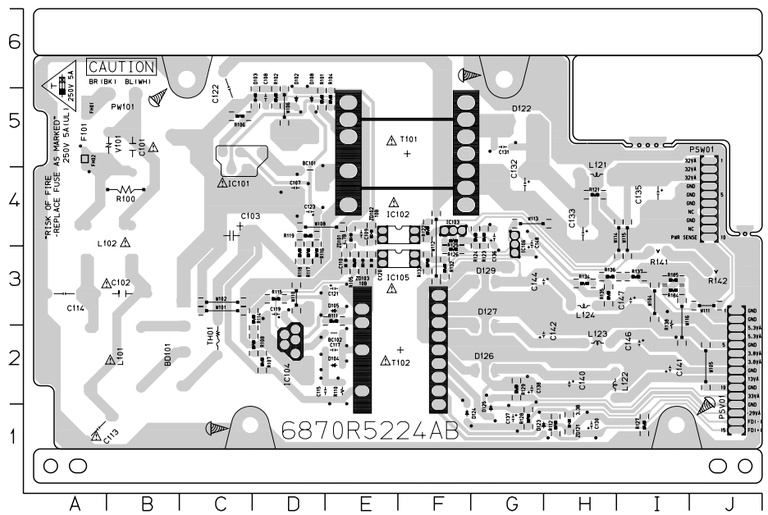
1. MAIN P.C.BOARD



LOCATION GUIDE

C163	D5	C602	E12	IC161	E4
C164	E4	C611	I11	IC162	E5
C165	E6	C612	E12	IC163	D4
C166	D2	C613	B9	IC164	A5
C167	F2	C614	E11	IC302	C9
C168	E2	C616	D10	IC503	N12
C169	D4	C617	C10	IC504	P9
C170	F4	C618	C10	IC505	O6
C171	B2	C701	C10	J501	P2
C172	B3	C702	B8	J502	K2
C173	C5	C730	A11	JK801	A10
C174	C5	C731	C9	JK802	A5
C175	C5	C732	D11	L301	H4
C176	C6	C801	G8	L302	I6
C177	D4	C806	F8	L303	J8
C178	A4	C807	F8	L304	I9
C301	H5	C808	F8	L305	I9
C302	I4	C816	G7	L501	N2
C308	H8	C821	G7	L510	N10
C310	H8	C824	G7	L511	O9
C311	H7	C825	G7	L512	N2
C312	H7	C826	H7	L706	C8
C315	H7	C828	H7	L822	G10
C318	I6	C829	H7	L823	E10
C319	I7	C830	H8	L824	F6
C324	I7	C831	G8	LD501	L7
C325	I7	C833	G9	MS501	M3
C327	J7	C839	G10	P3D01	H8
C328	J7	C840	G10	P3D02	H6
C329	K11	C842	F10	P3D03	I12
C330	J7	C843	F9	PMC01	I3
C331	I12	C846	F10	PMF01	N12
C332	J7	C847	F10	PV601	P3
C333	J7	C851	G7	PV602	P4
C334	J8	C866	F8	PVD01	D6
C335	J7	C871	C6	PVD02	G12
C339	J8	C873	F10	PVD03	L12
C340	J8	C876	E10	PVS01	D2
C342	J8	C877	E10	Q161	C5
C344	J9	C879	E9	Q162	C6
C346	I9	C880	E10	Q163	C5
C350	I9	C881	E9	Q166	E2
C352	K9	C882	F9	Q167	E2
C355	H3	C883	F9	Q168	D4
C360	C9	C886	E9	Q169	E2
C361	C8	C887	E9	Q304	H5
C362	N2	C888	E8	Q305	H4
C500	O8	C889	F8	Q308	H4
C503	N10	CS501	O11	Q503	O7
C526	F2	D160	F3	Q508	O4
C531	N10	D161	E3	RS501	N5
C534	O5	D163	C4	RS502	N9
C535	O5	D165	E3	TU701	A11
C546	I3	D802	I10	X301	J9
C561	O3	ES501	J1	X501	O8
C578	M5	ES502	L12	X502	O9
C579	M4	F616	B10	ZD161	D2
C584	M5	F617	B10	ZD162	C5
C586	P8	F618	B10	ZD163	C5
C592	O3	FL301	H4	ZD164	A4
C601	E12	IC160	D5		

2. POWER P.C.BOARD

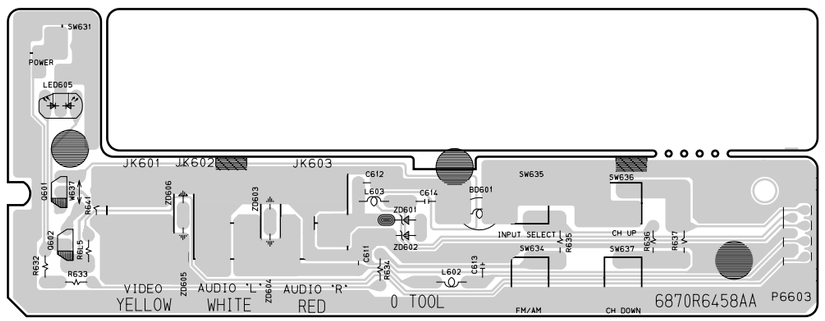


NOTES) ⚠ Warning
Parts that are shaded are critical With respect to risk of fire or electricial shock.

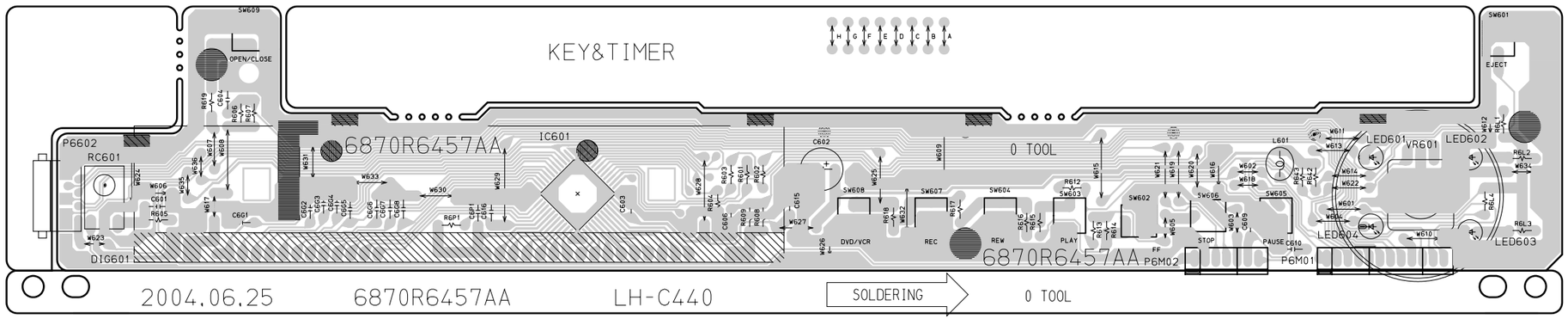
LOCATION GUIDE

BC101	D4	D104	E2	R111	E3
BC102	E2	D105	E3	R112	H1
BD101	B2	D108	D5	R114	D3
C101	B5	D122	G5	R115	D3
C102	B3	D123	H1	R116	D3
C103	C4	D124	F1	R117	D3
C107	D4	D125	G1	R118	D3
C108	D5	D126	G2	R119	D4
C109	E4	D127	G2	R121	H4
C110	E3	D129	G3	R122	F4
C113	A1	FH01	A5	R123	G4
C114	A3	FH02	A5	R124	G4
C115	E2	IC101	C5	R125	F4
C117	E2	IC102	F4	R126	F3
C119	D3	IC103	F4	R127	I1
C120	E3	IC104	D2	R128	G1
C121	E3	IC105	F3	R129	G2
C122	C5	IC106	G4	R132	F3
C123	D4	L101	B2	R133	F3
C130	H1	L102	B4	R134	H3
C131	G5	L121	H4	R135	H3
C132	G4	L122	H2	R136	H3
C133	H4	L123	H2	R137	I3
C135	I4	L124	H3	R138	I3
C136	G4	PSV01	J3	R141	I3
C137	G1	PSW01	J5	R142	J3
C138	G2	PW101	B5	R184	I3
C140	H2	R100	B4	R185	I3
C141	I2	R101	D5	T101	F5
C142	H2	R102	D5	T102	F2
C144	H3	R104	E5	TH01	C2
C146	I2	R105	E3	V101	B5
C147	I3	R106	C5	ZD101	E4
C148	G4	R107	D2	ZD102	E4
D102	D5	R108	D2	ZD103	E3
D103	D5	R110	E2	ZD121	H1

3. KEY 1(LEFT) P.C.BOARD

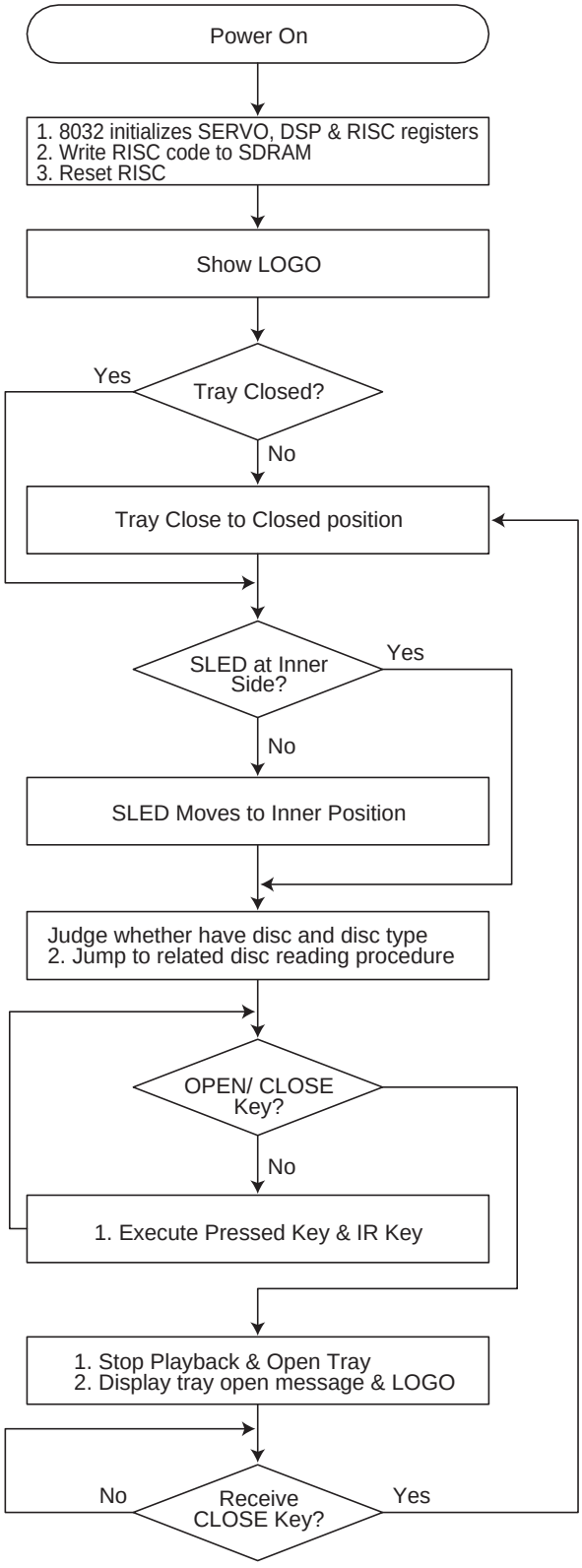


4. KEY 2(RIGHT) P.C.BOARD

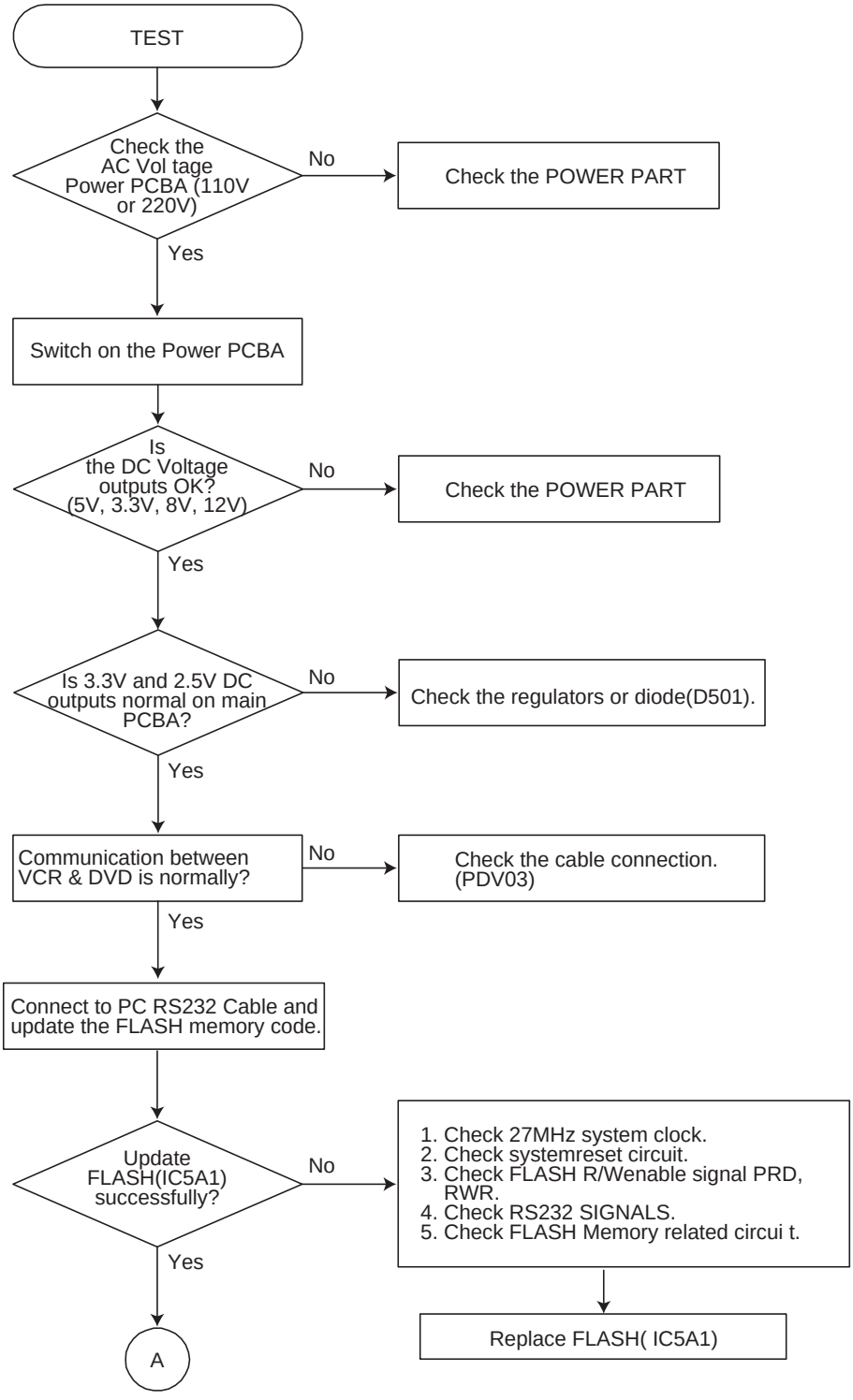


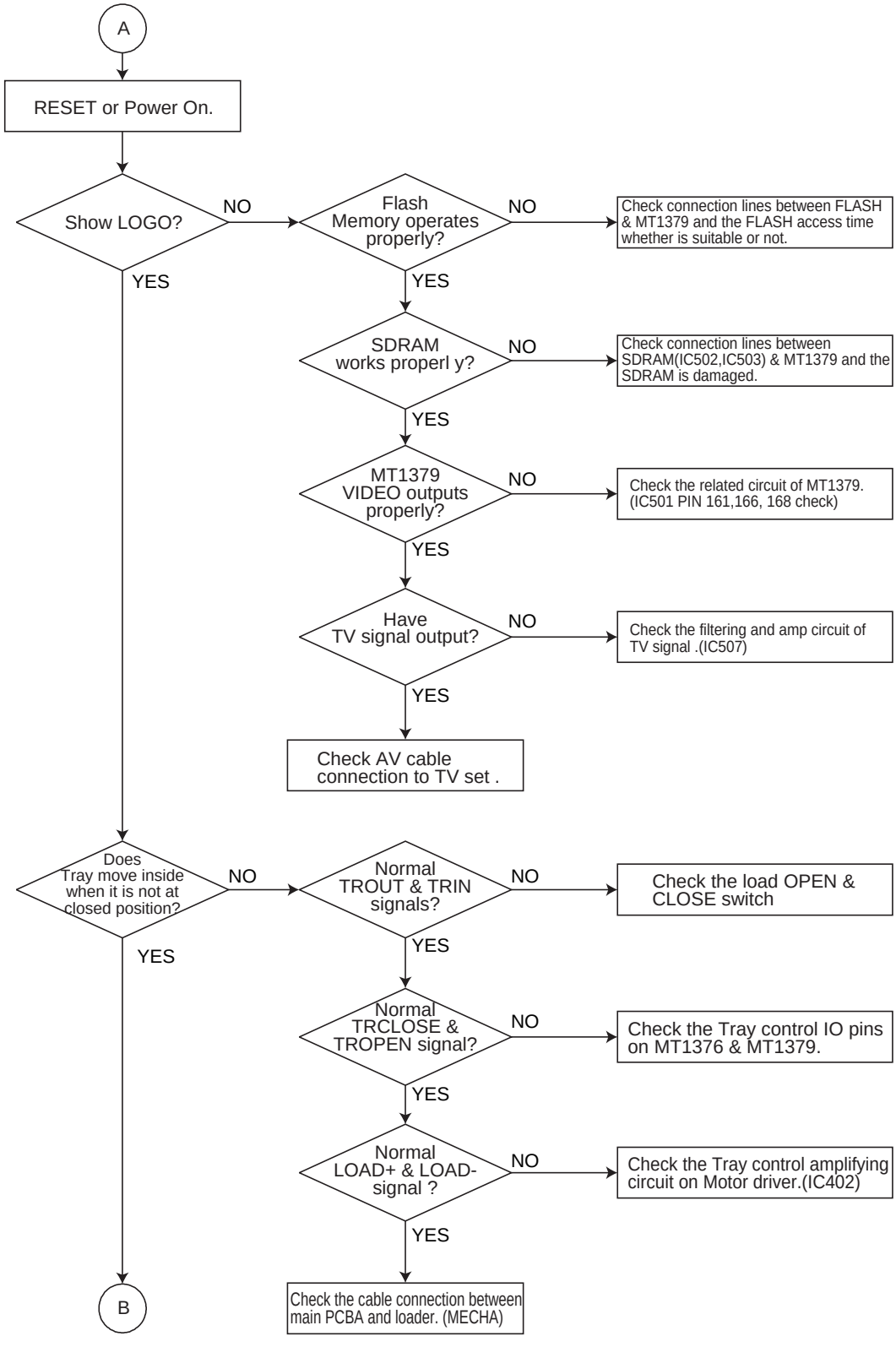
DVD & AMP PART
ELECTRICAL TROUBLESHOOTING GUIDE

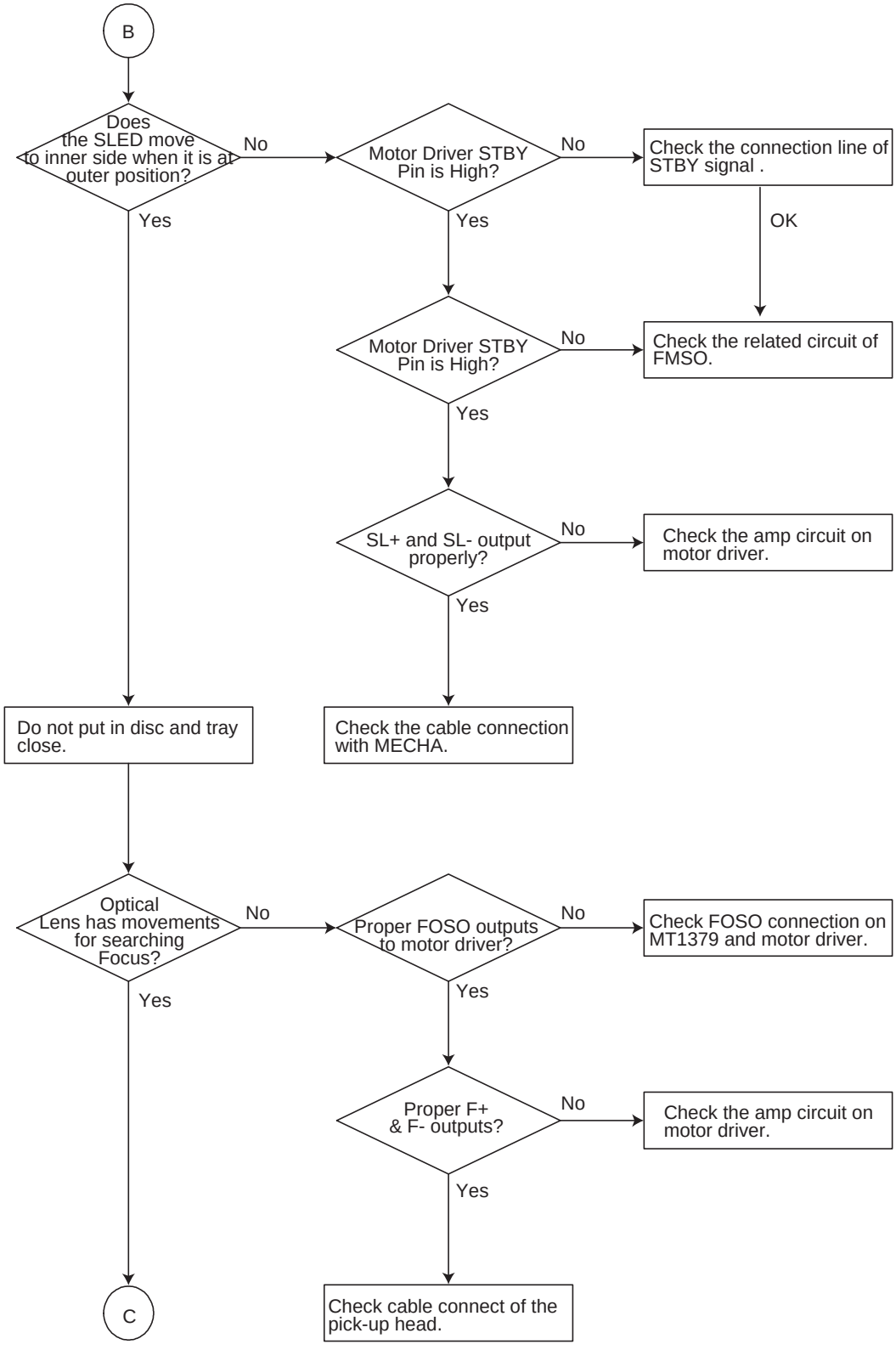
1. System operation flow

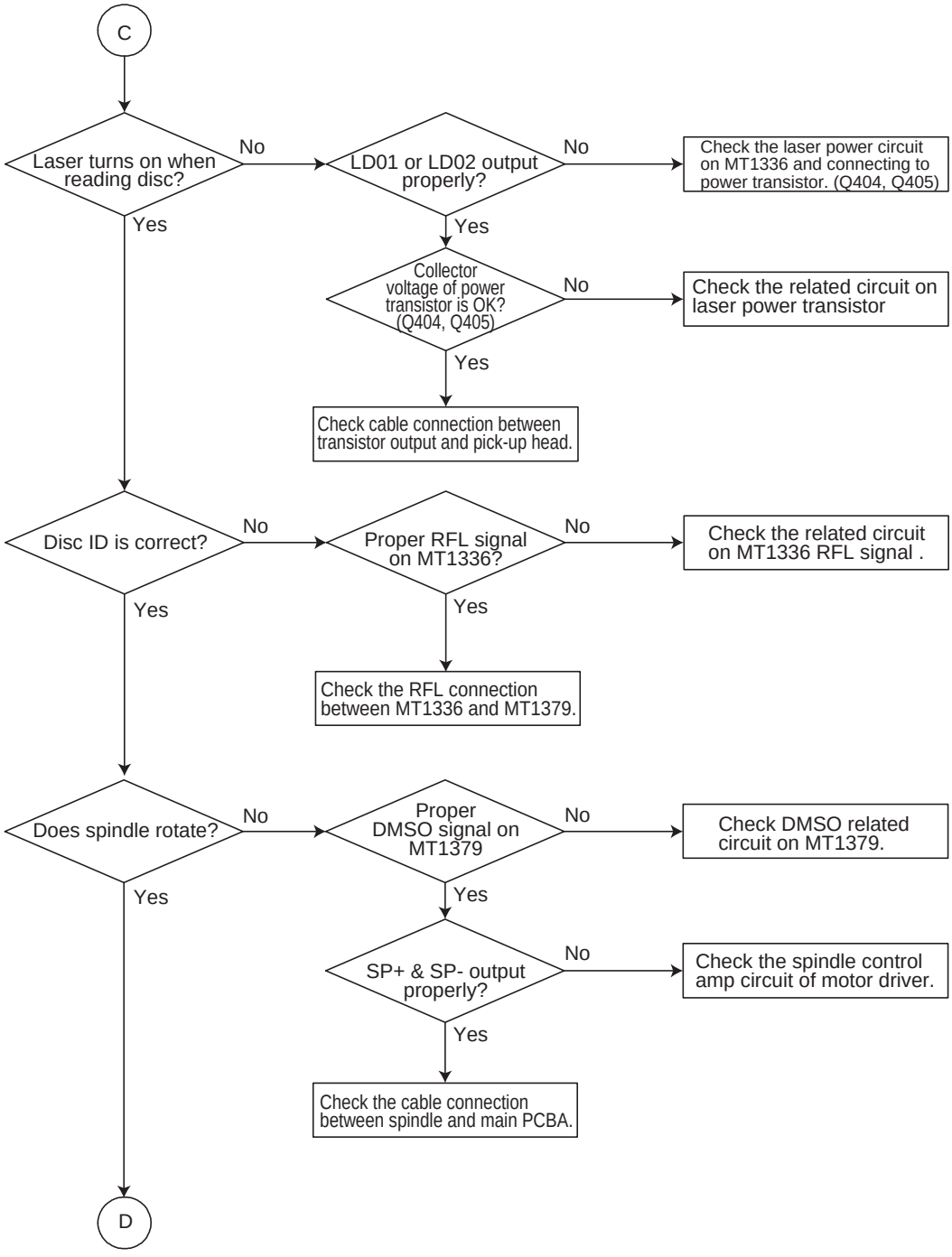


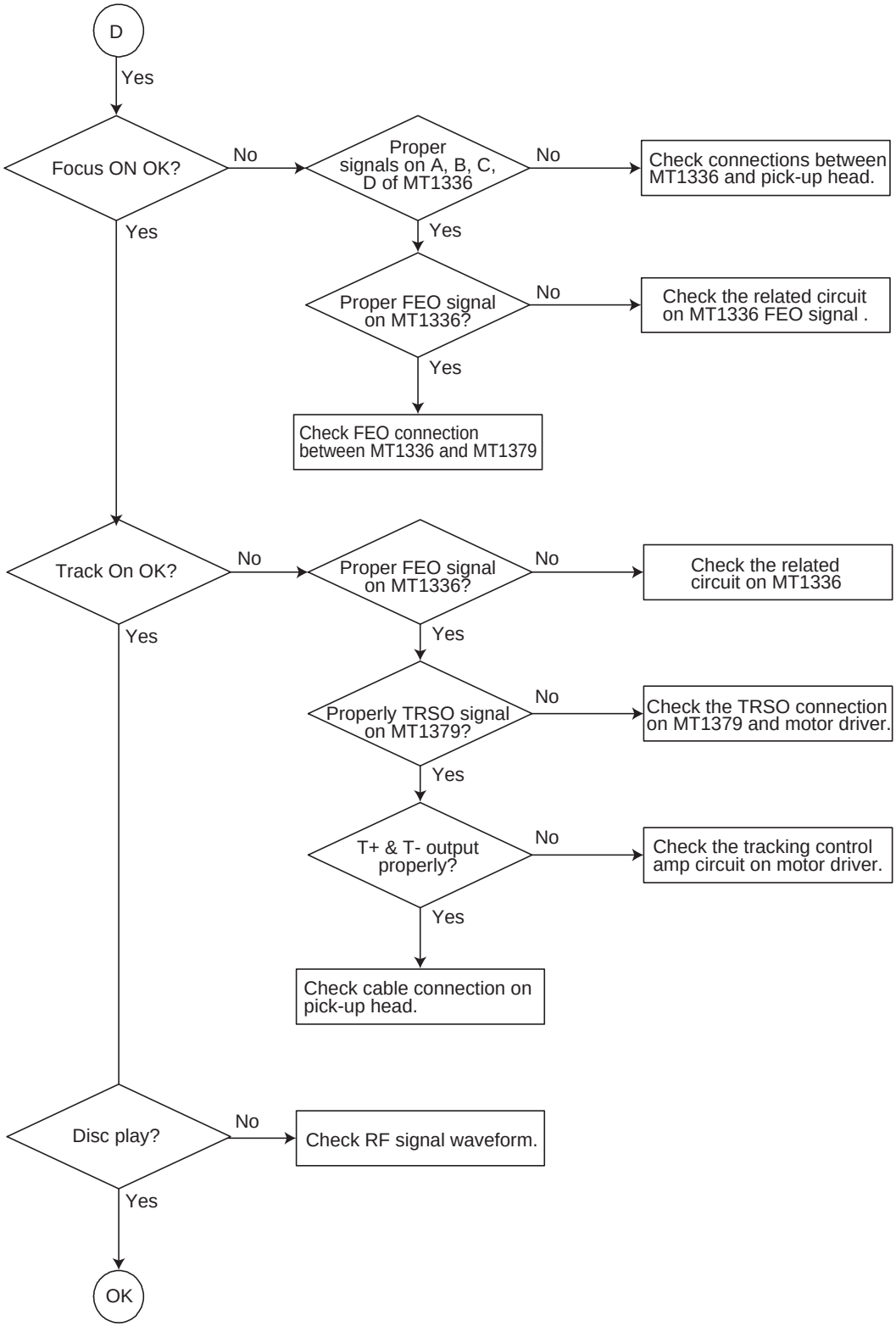
2. Test & debug flow

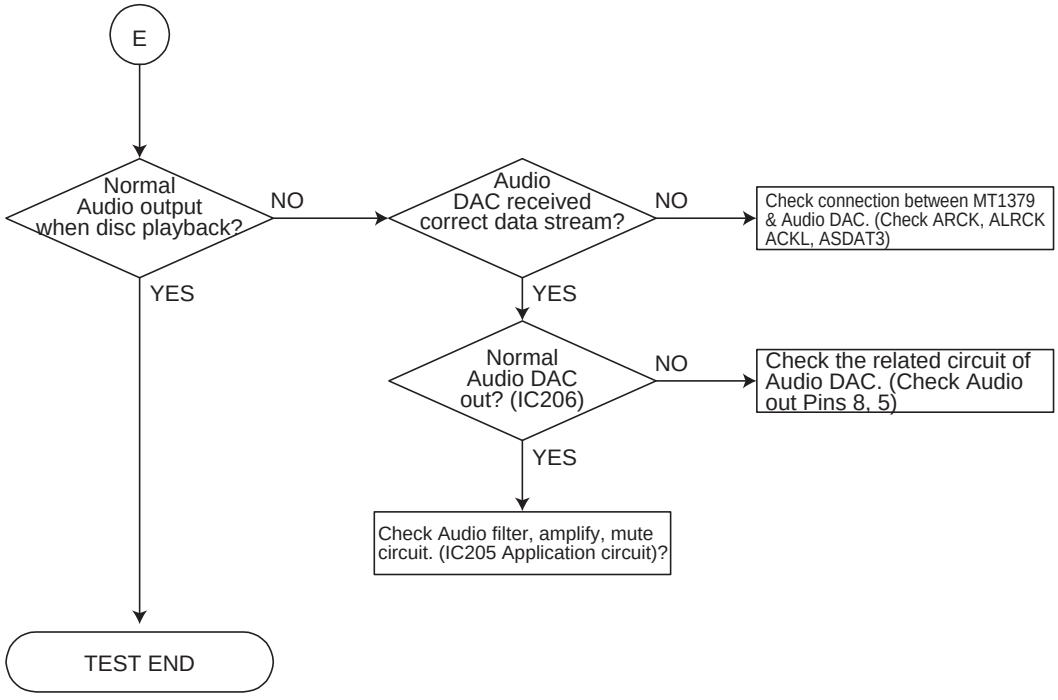

TEST
Check the AC Vol tage Power PCBA (110V or 220V)
No
Check the POWER PART
Yes
Switch on the Power PCBA
Is the DC Voltage outputs OK? (5V, 3.3V, 8V, 12V)
No
Check the POWER PART
Yes
Is 3.3V and 2.5V DC outputs normal on main PCBA?
No
Check the regulators or diode(D501).
Yes
Communication between VCR & DVD is normally?
No
Check the cable connection. (PDV03)
Yes
Connect to PC RS232 Cable and update the FLASH memory code.
Update FLASH(IC5A1) successfully?
No
1. Check 27MHz system clock.
2. Check systemreset circuit.
3. Check FLASH R/Wenable signal PRD, RWR.
4. Check RS232 SIGNALS.
5. Check FLASH Memory related circui t.
Replace FLASH(IC5A1)
Yes
A


A
RESET or Power On.
Show LOGO?
NO
YES
Flash Memory operates properly?
NO
YES
Check connection lines between FLASH & MT1379 and the FLASH access time whether is suitable or not.
SDRAM works properl y?
NO
YES
Check connection lines between SDRAM(IC502,IC503) & MT1379 and the SDRAM is damaged.
MT1379 VIDEO outputs properly?
NO
YES
Check the related circuit of MT1379. (IC501 PIN 161,166, 168 check)
Have TV signal output?
NO
YES
Check the filtering and amp circuit of TV signal .(IC507)
Check AV cable connection to TV set .
Does Tray move inside when it is not at closed position?
NO
YES
Normal TROUT & TRIN signals?
NO
YES
Check the load OPEN & CLOSE switch
Normal TRCLOSE & TROPEN signal?
NO
YES
Check the Tray control IO pins on MT1376 & MT1379.
Normal LOAD+ & LOAD- signal ?
NO
YES
Check the Tray control amplifying circuit on Motor driver.(IC402)
Check the cable connection between main PCBA and loader. (MECHA)
B

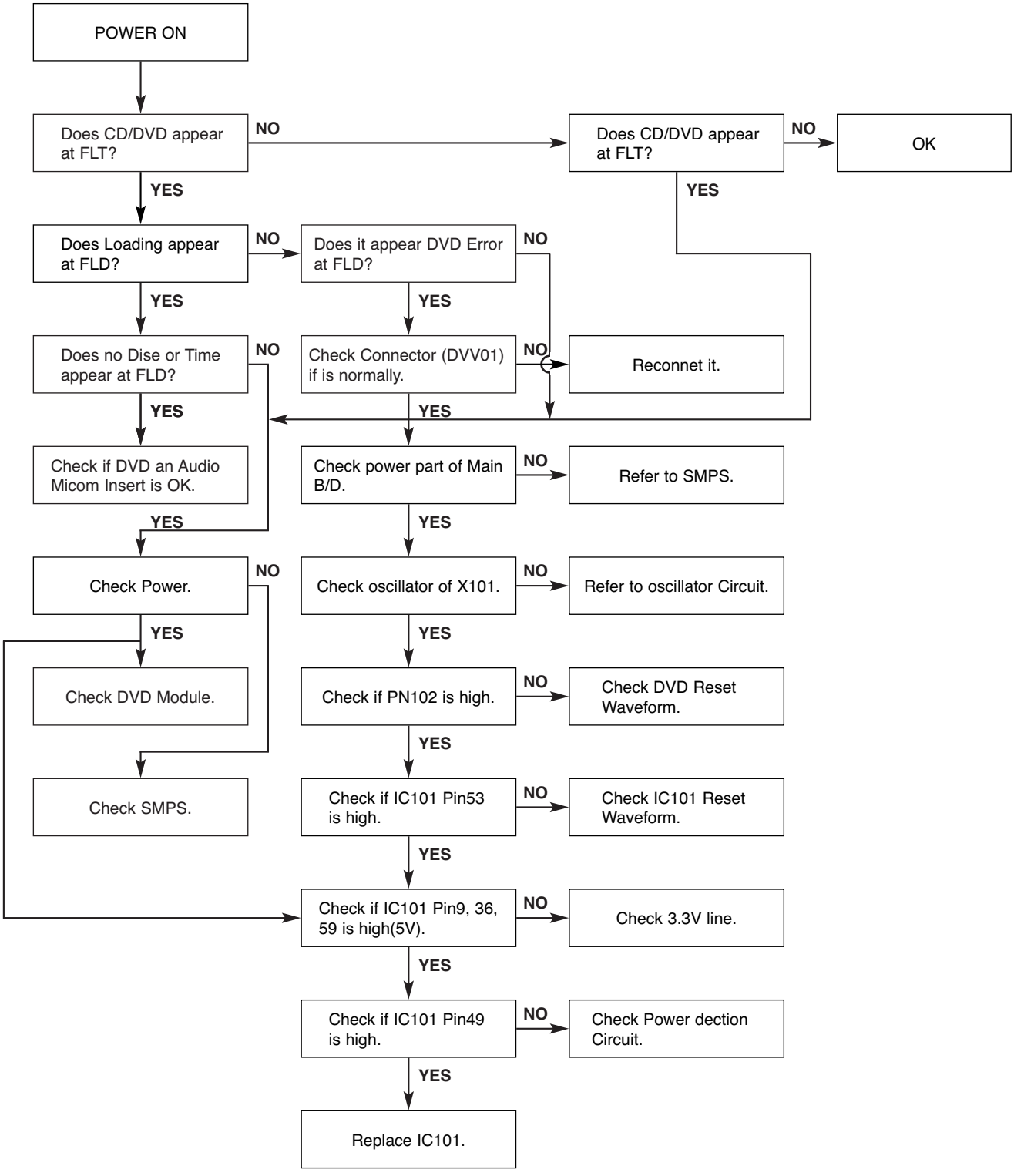

B
Does the SLED move to inner side when it is at outer position?
No
Yes
Motor Driver STBY Pin is High?
No
Check the connection line of STBY signal .
OK
Yes
Motor Driver STBY Pin is High?
No
Check the related circuit of FMSO.
Yes
SL+ and SL- output properly?
No
Check the amp circuit on motor driver.
Yes
Do not put in disc and tray close.
Check the cable connection with MECHA.
Optical Lens has movements for searching Focus?
No
Yes
Proper FOSO outputs to motor driver?
No
Check FOSO connection on MT1379 and motor driver.
Yes
Proper F+ & F- outputs?
No
Check the amp circuit on motor driver.
Yes
C
Check cable connect of the pick-up head.


C
Laser turns on when reading disc?
No
LD01 or LD02 output properly?
No
Check the laser power circuit on MT1336 and connecting to power transistor. (Q404, Q405)
Yes
Yes
Collector voltage of power transistor is OK? (Q404, Q405)
No
Check the related circuit on laser power transistor
Yes
Check cable connection between transistor output and pick-up head.
Disc ID is correct?
No
Proper RFL signal on MT1336?
No
Check the related circuit on MT1336 RFL signal .
Yes
Yes
Check the RFL connection between MT1336 and MT1379.
Does spindle rotate?
No
Proper DMSO signal on MT1379
No
Check DMSO related circuit on MT1379.
Yes
Yes
SP+ & SP- output properly?
No
Check the spindle control amp circuit of motor driver.
Yes
Check the cable connection between spindle and main PCBA.
D


D
Yes
Focus ON OK?
No
Proper signals on A, B, C, D of MT1336
No
Check connections between MT1336 and pick-up head.
Yes
Yes
Proper FEO signal on MT1336?
No
Check the related circuit on MT1336 FEO signal .
Yes
Check FEO connection between MT1336 and MT1379
Track On OK?
No
Proper FEO signal on MT1336?
No
Check the related circuit on MT1336
Yes
Yes
Properly TRSO signal on MT1379?
No
Check the TRSO connection on MT1379 and motor driver.
Yes
T+ & T- output properly?
No
Check the tracking control amp circuit on motor driver.
Yes
Check cable connection on pick-up head.
Disc play?
No
Check RF signal waveform.
Yes
OK


E
Normal Audio output when disc playback?
NO
Audio DAC received correct data stream?
NO
Check connection between MT1379 & Audio DAC. (Check ARCK, ALRCK ACKL, ASDAT3)
YES
YES
Normal Audio DAC out? (IC206)
NO
Check the related circuit of Audio DAC. (Check Audio out Pins 8, 5)
YES
Check Audio filter, amplify, mute circuit. (IC205 Application circuit)?
TEST END

3. AUDIO μ-COM Circuit(DVD & AMP)



DETAILS AND WAVEFORMS ON SYSTEM TEST AND DEBUGGING

1. SYSTEM 27MHz CLOCK,RESET,FLASH R/W SIGNAL

1) MT1379 main clock is at 27MHz(X501)

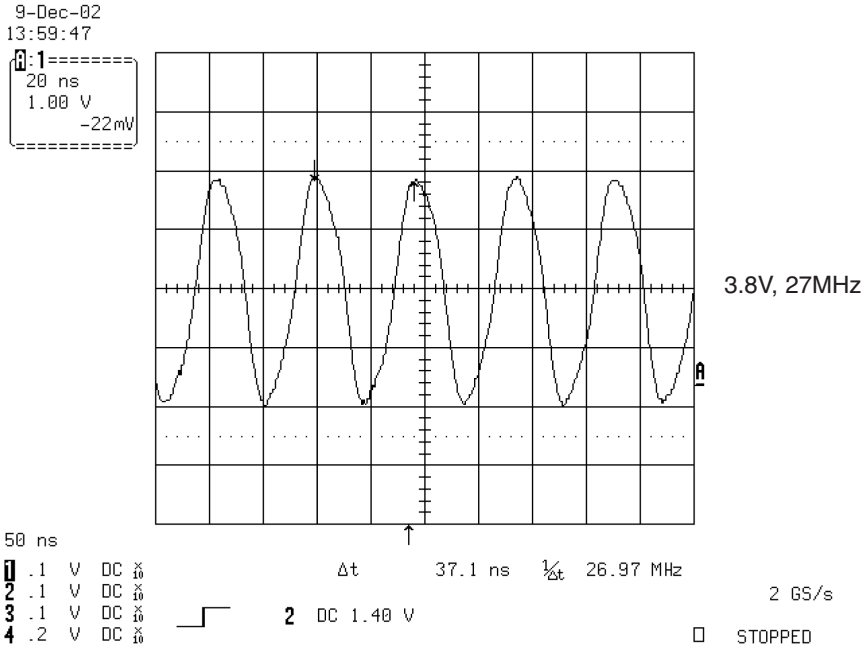


FIG 1-1

2) MT1379 & MT1336 reset is high active.

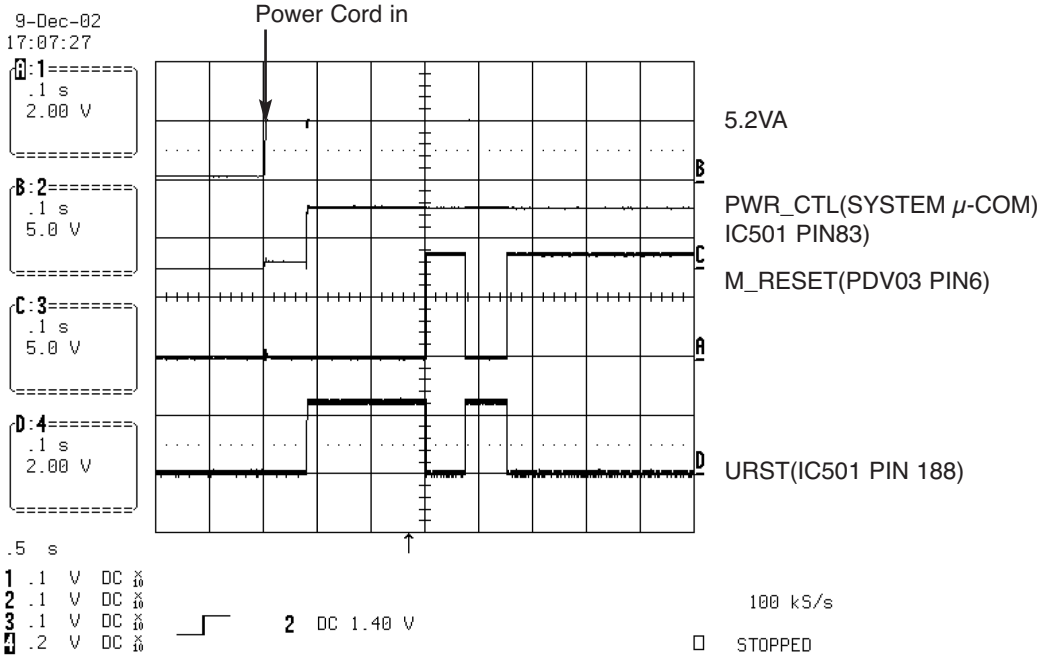


FIG 1-2

3) RS232 waveform during procedure(Downloading)

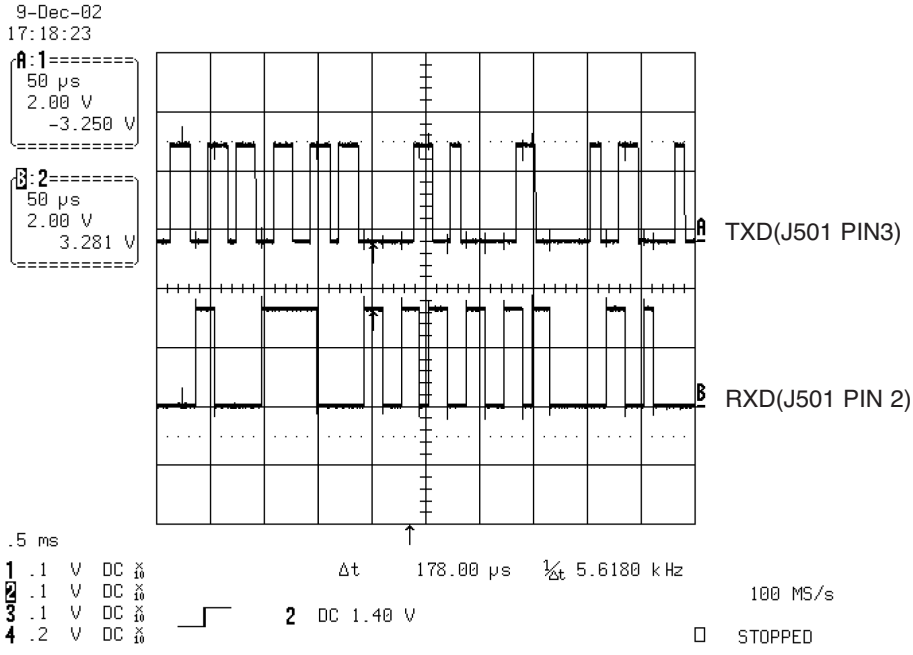


FIG 1-3

4) Flash R/W enable signal during download(Downloading)

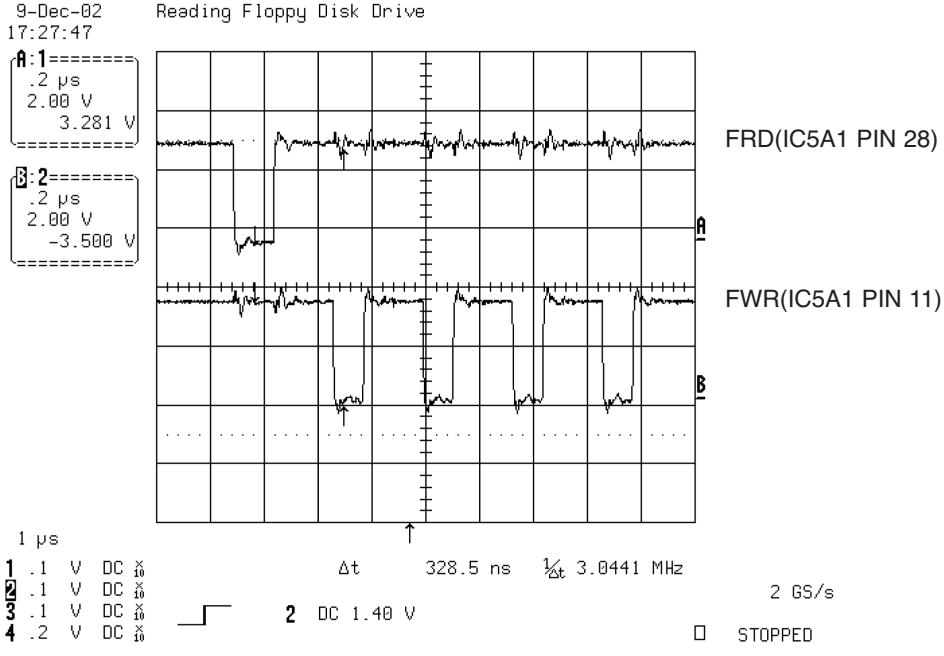


FIG 1-4

2. SDRAM CLOCK

1) MT1379 main clock is at 27MHz(X501)

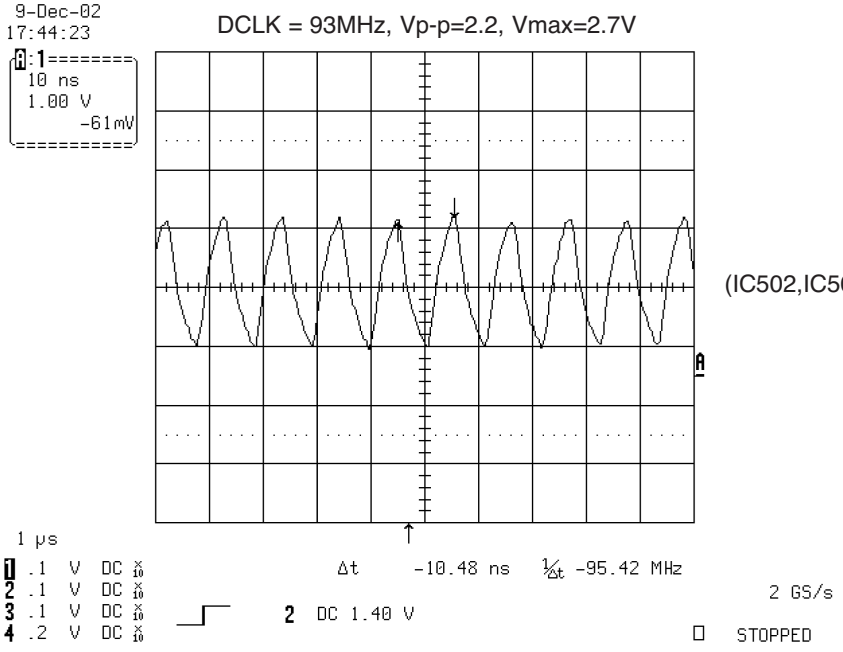


FIG 2-1

3. TRAY OPEN/CLOSE SIGNAL

1) Tray open/close waveform

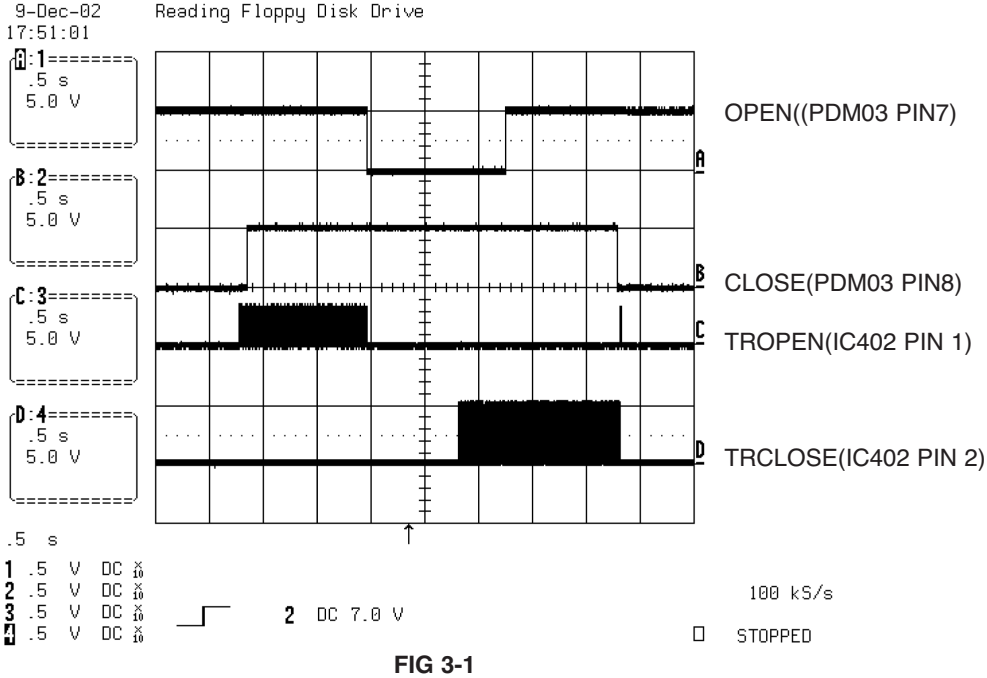


FIG 3-1

2) Tray close waveform

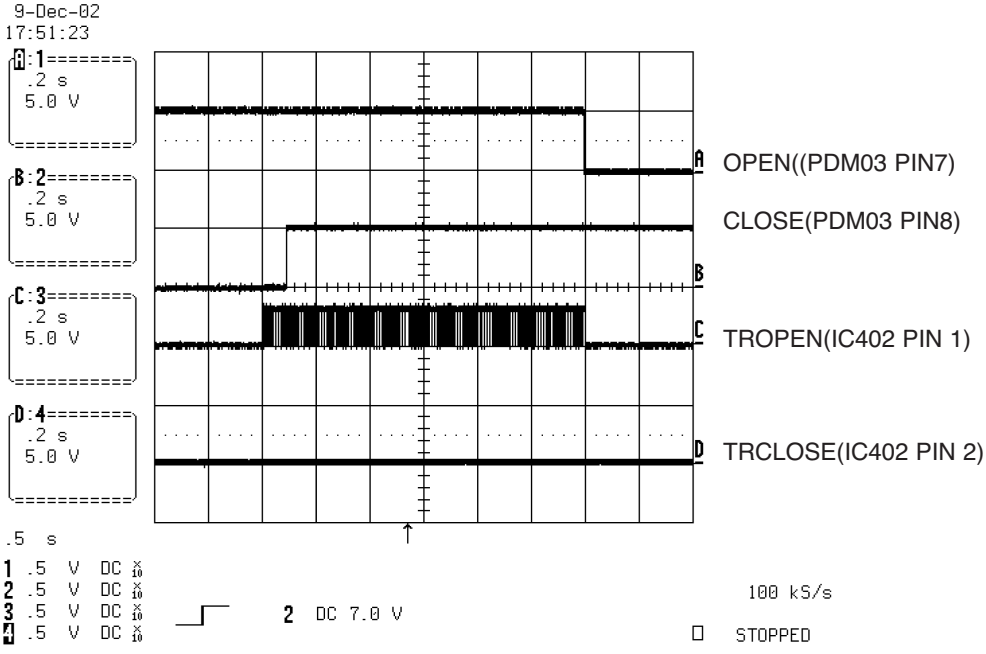


FIG 3-2

3) Tray open waveform

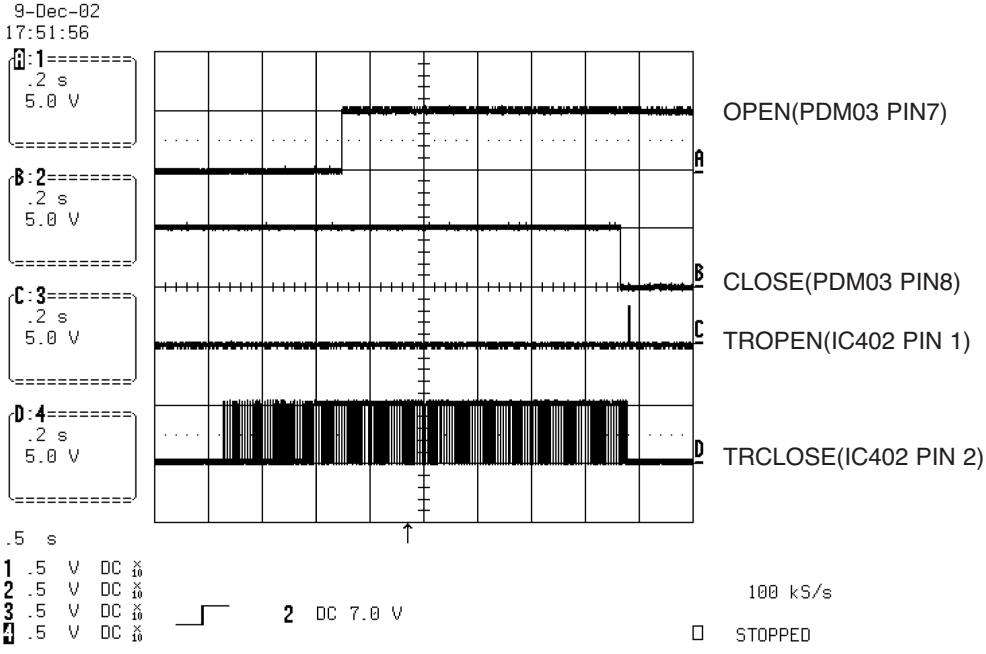


FIG 3-3

4. SLED CONTROL RELATED SIGNAL (NO DISC CONDITION)

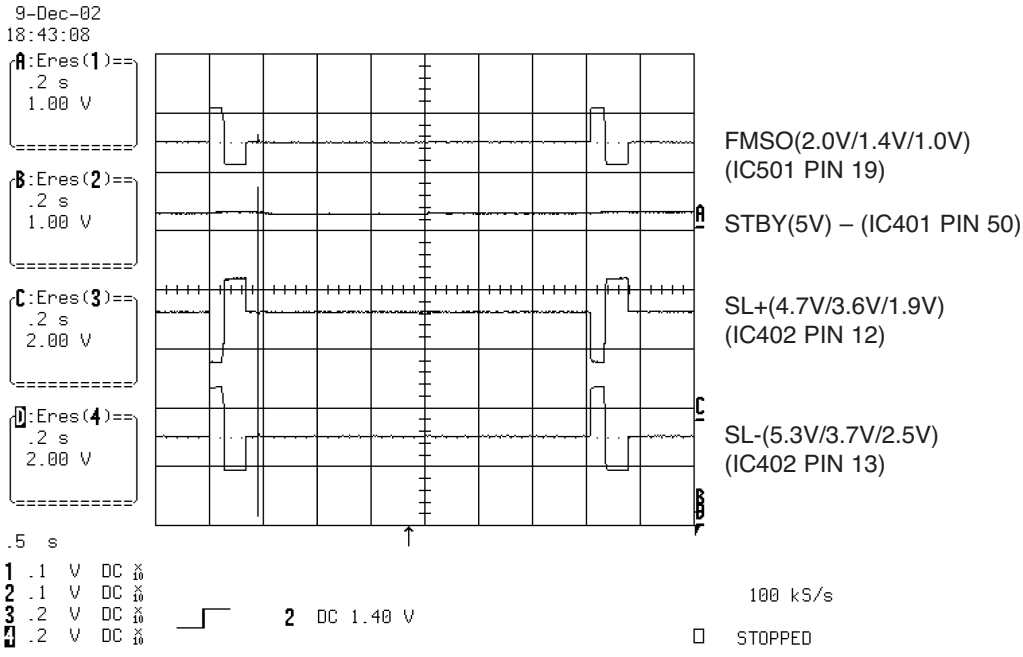


FIG 4-1

5. LENS CONTROL RELATED SIGNAL(NO DISC CONDITION)

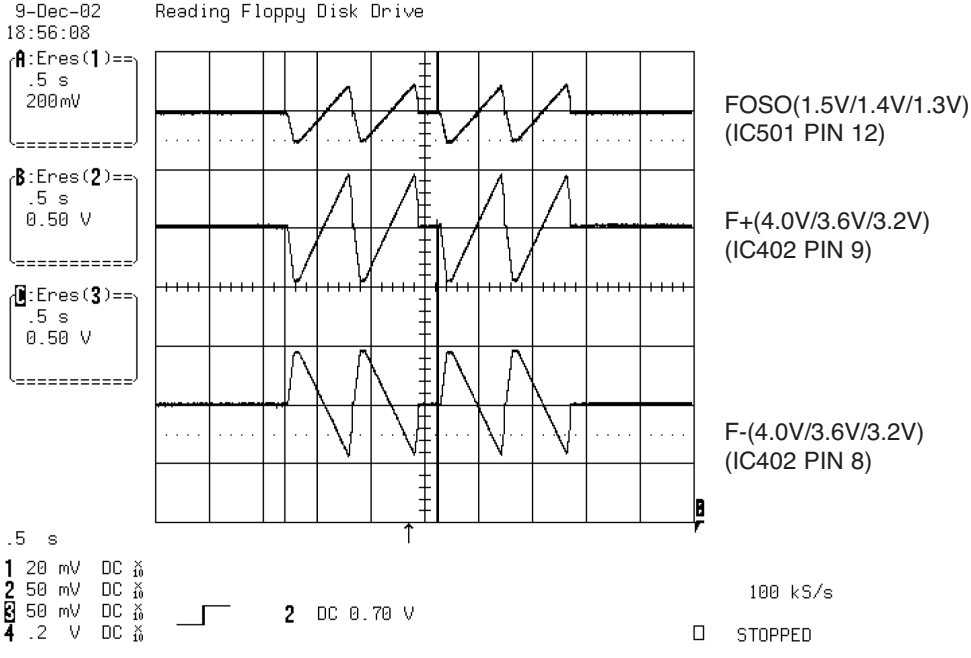


FIG 5-1

6. LASER POWER CONTROL RELATED SIGNAL(NO DISC CONDITION)

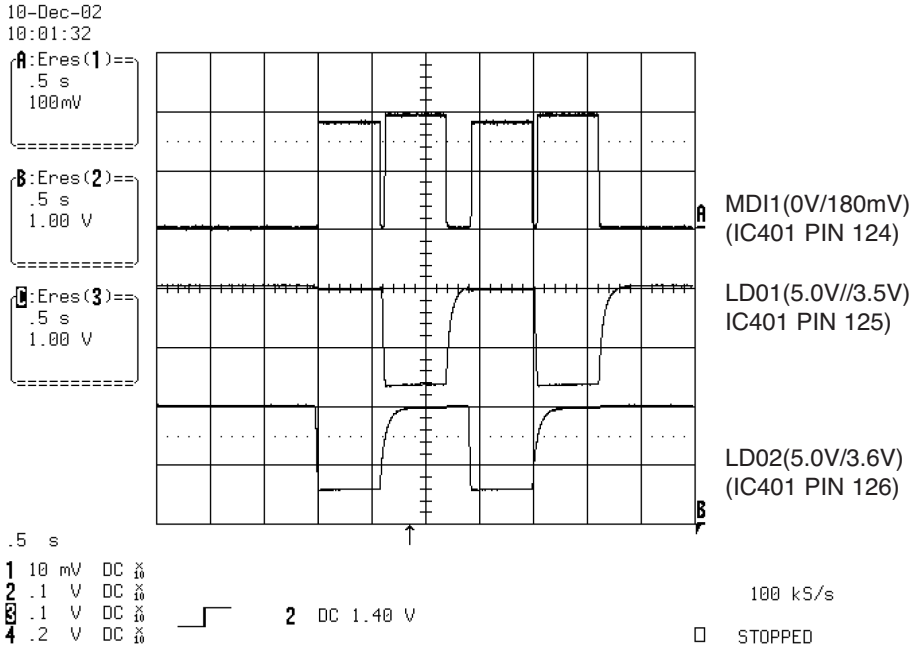


FIG 6-1

7. DISC TYPE JUDGEMENT WAVEFORMS

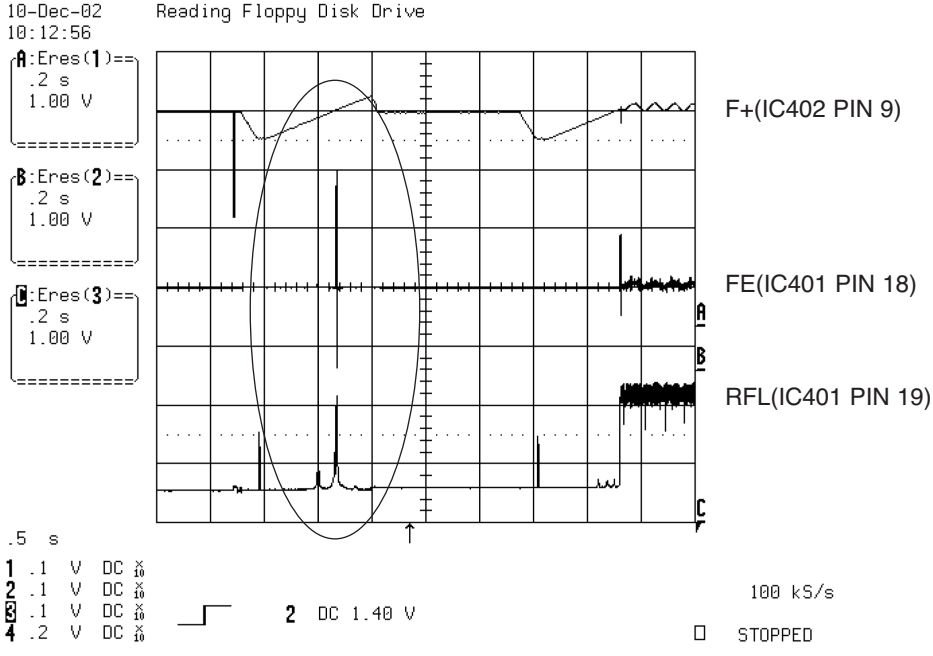


FIG 7-1 (DVD)

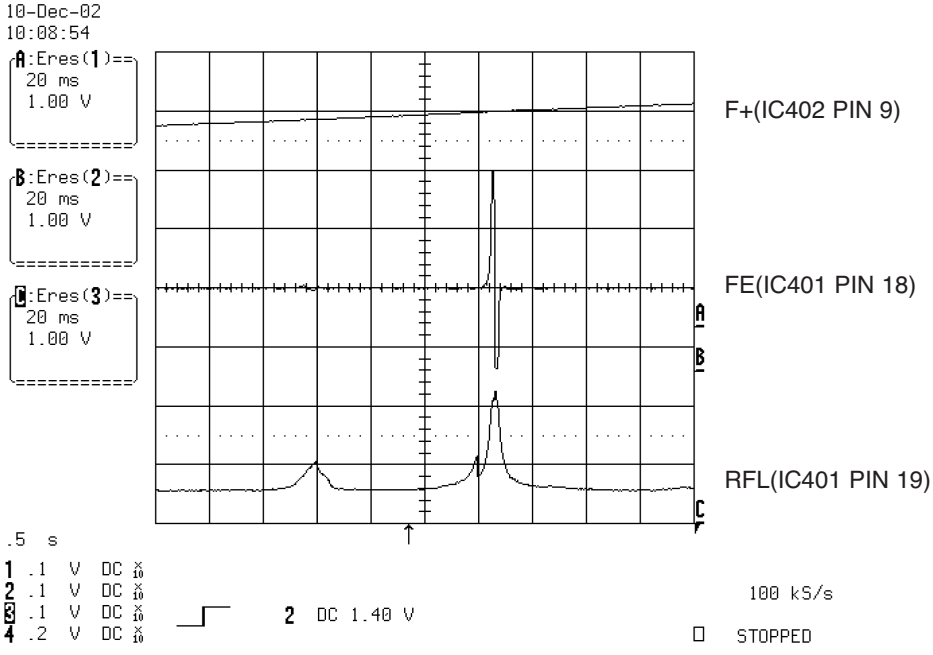


FIG 7-2 (DVD)

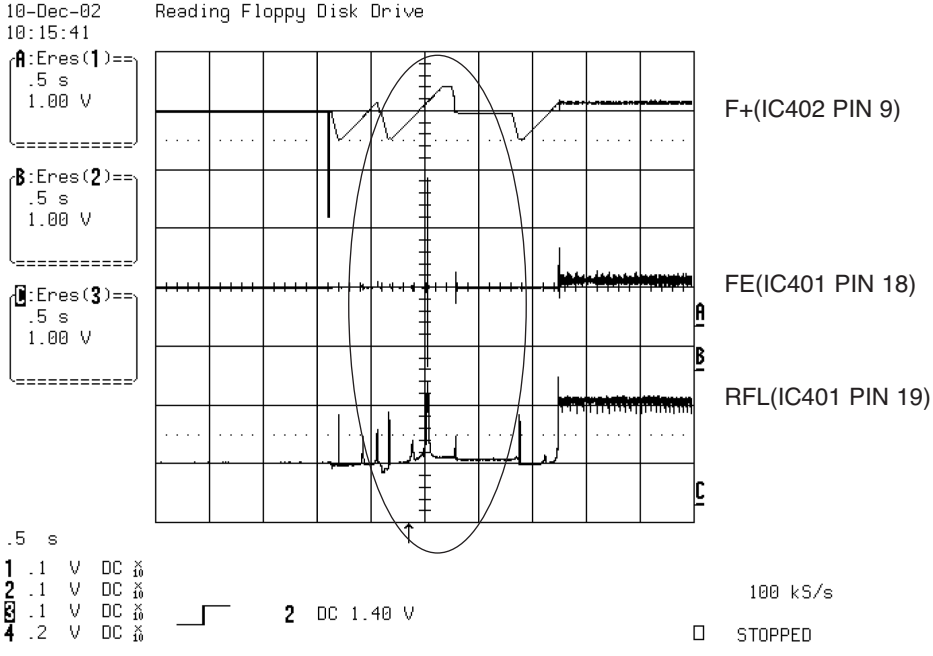


FIG 7-3 (CD)

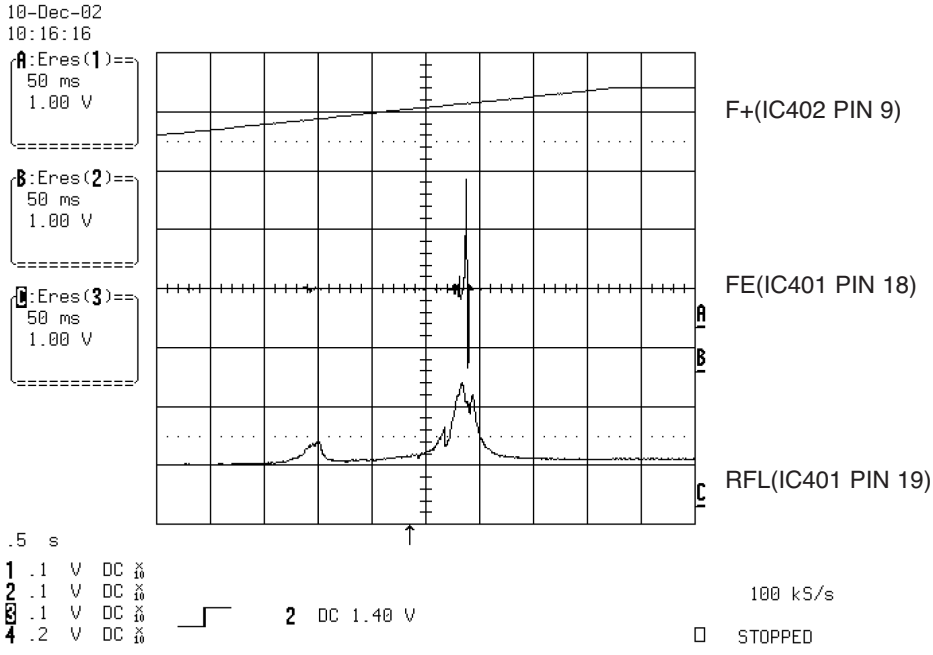


FIG 7-4 (CD)

8. FOCUS ON WAVEFORMS

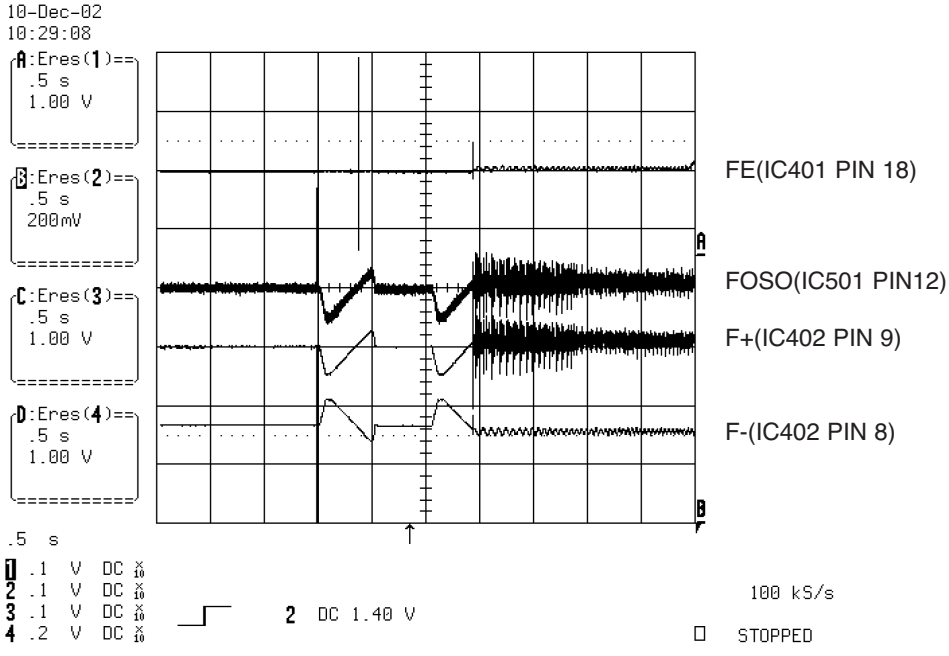


FIG 8-1 (DVD)

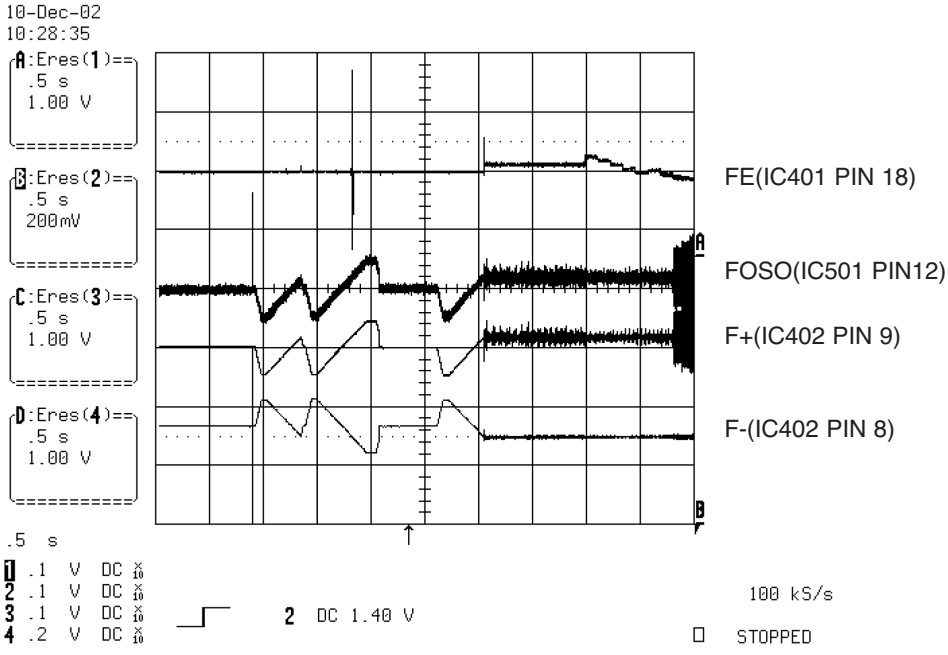


FIG 8-2 (CD)

9. SPINDLE CONTROL WAVEFORMS (NO DISC CONDITION)

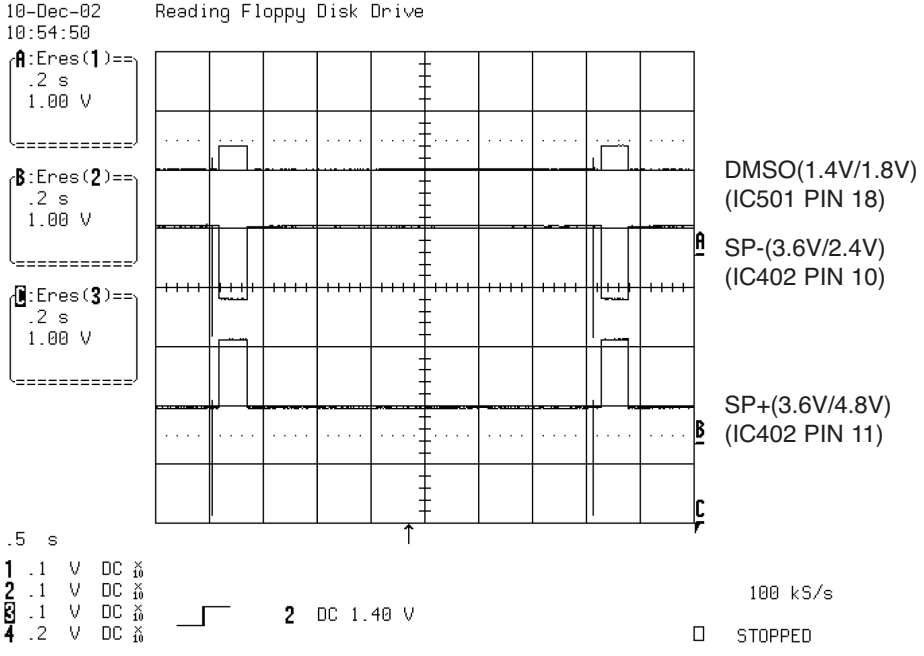


FIG 9-1

10. TRACKING CONTROL RELATED SIGNAL(System checking)

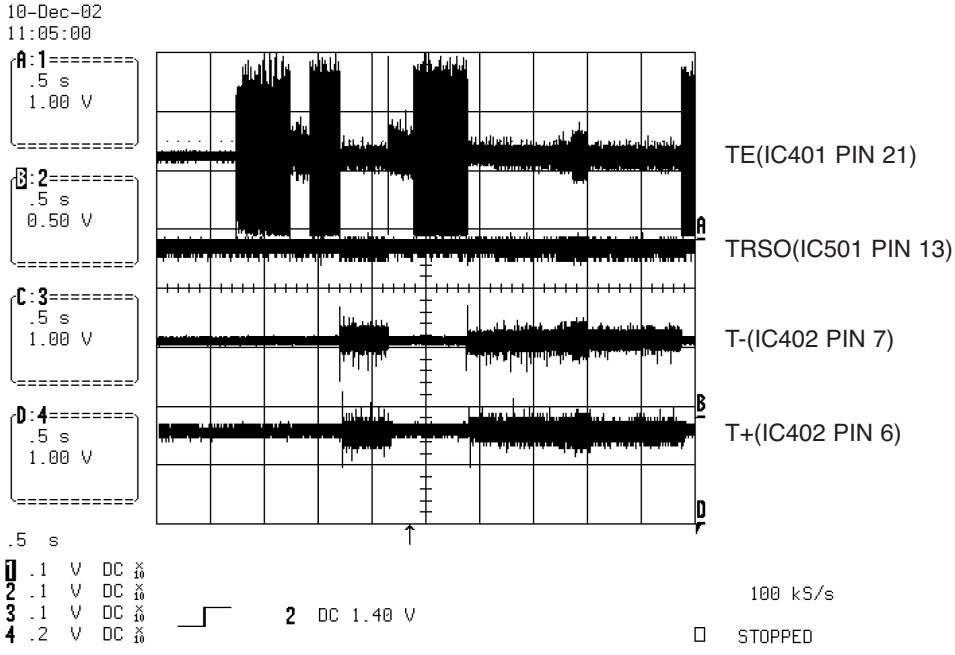


FIG 10-1(DVD)

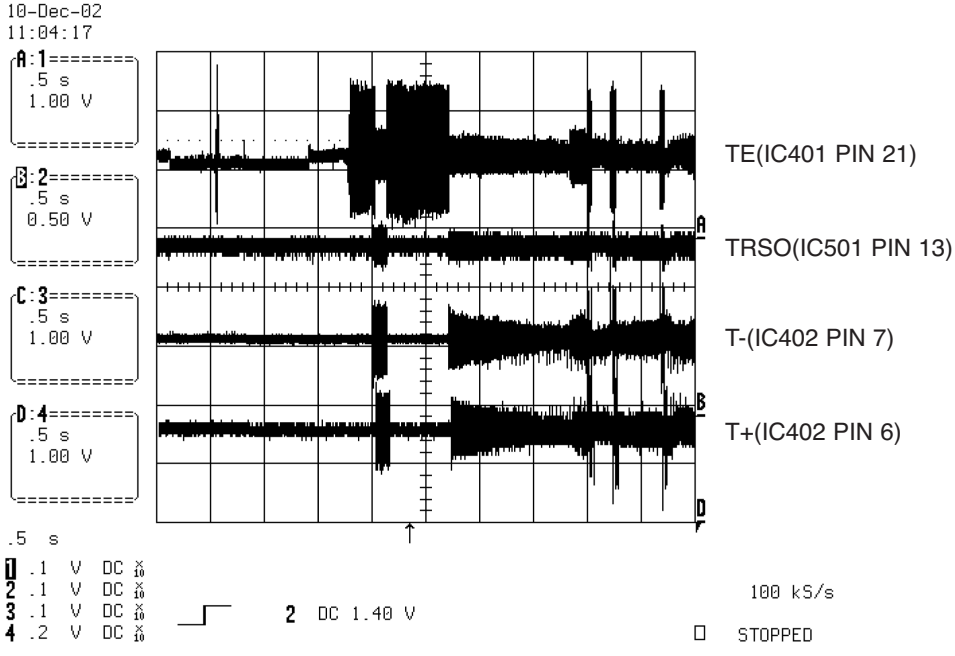


FIG 10-2(CD)

11. RF WAVEFORM

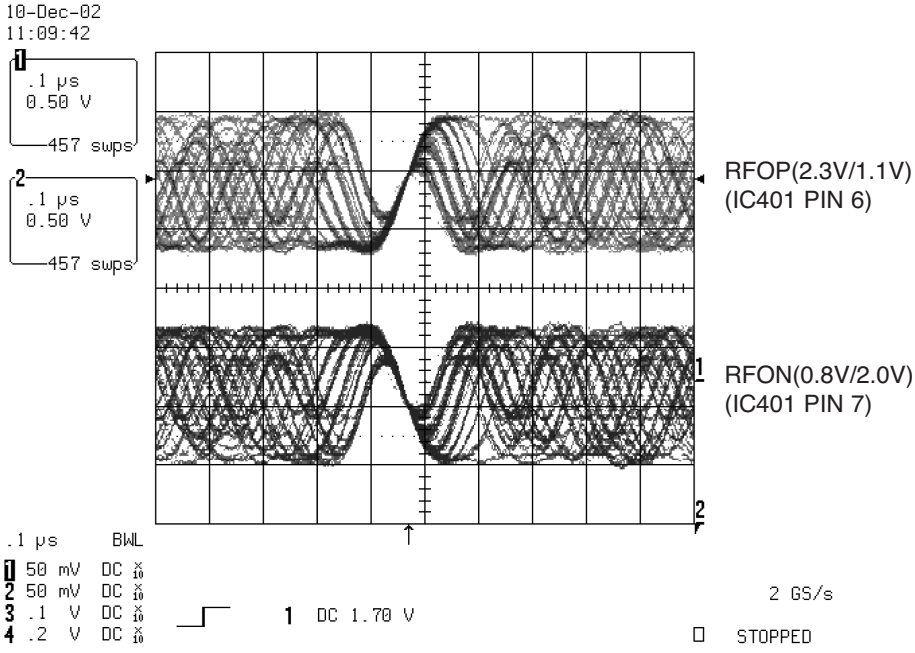


FIG 11-1

12. MT1379 VIDEO OUTPUT WAVEFORMS

1) Full colorbar signal(CVBS)

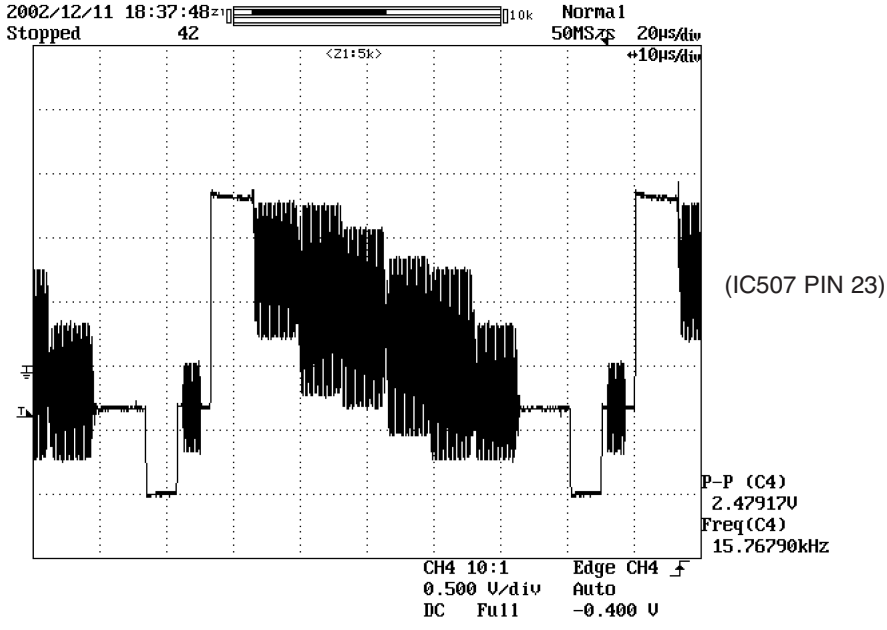
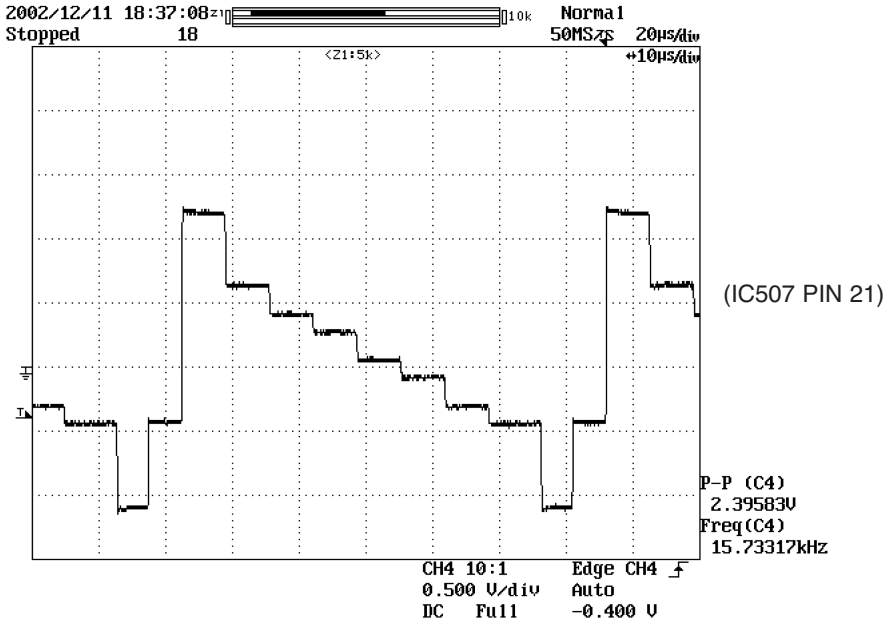


FIG 12-1

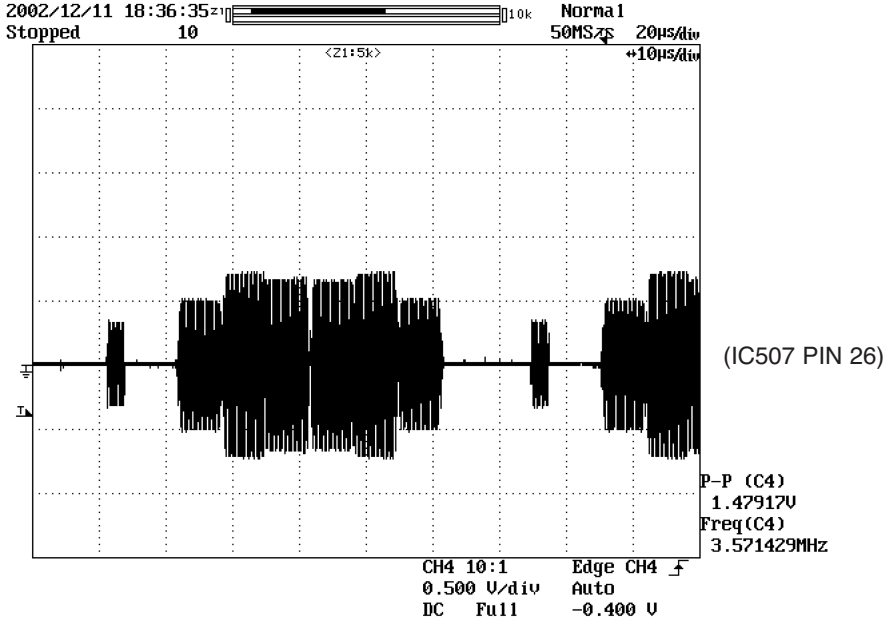
2) Y



(IC507 PIN 21)

FIG 12-2

3) C



(IC507 PIN 26)

FIG 12-3

13. AUDIO OUTPUT FROM AUDIO DAC

1) Audio L/R

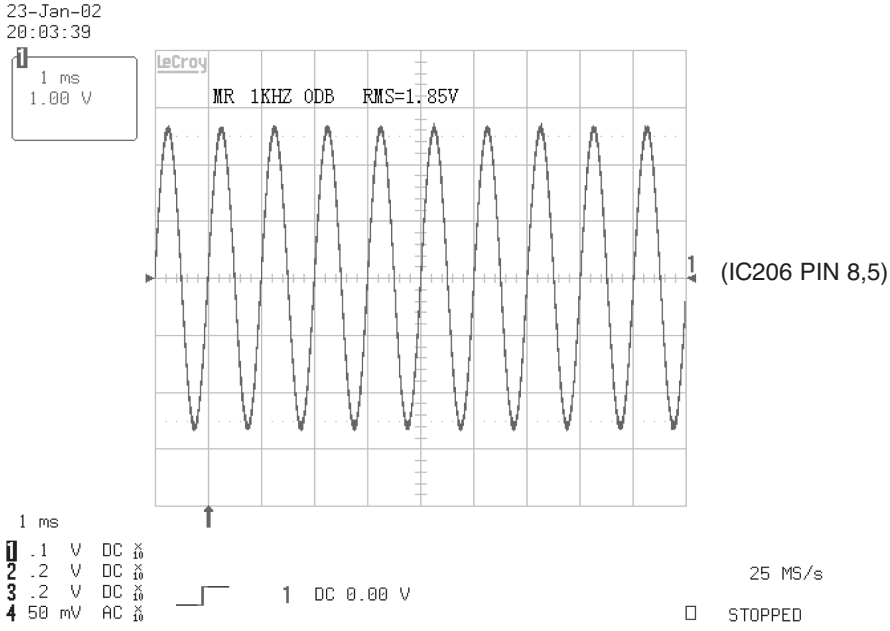


FIG 13-1

2) Audio related Signal

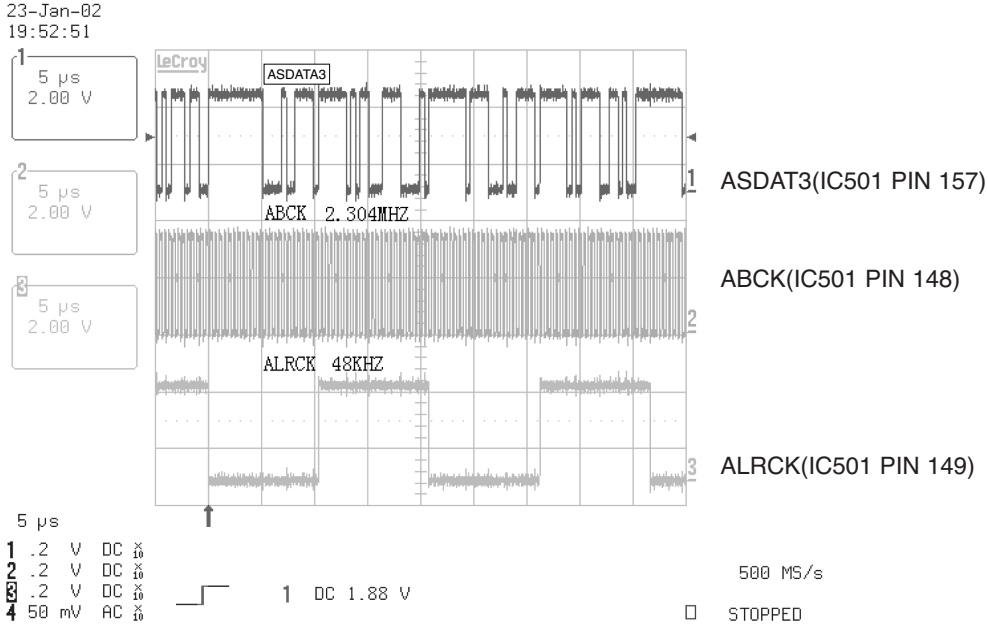
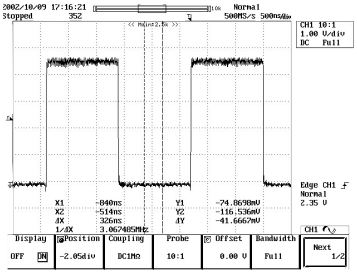


FIG 13-2

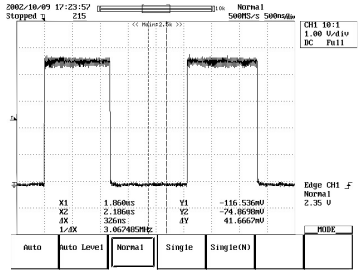
14. DVD & AMP WAVEFORMS

1)



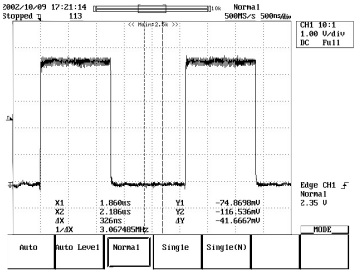
• R311 → FRONT L

2)



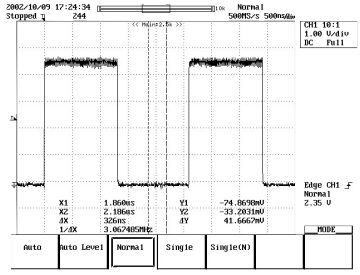
• R303 → FRONT R

3)



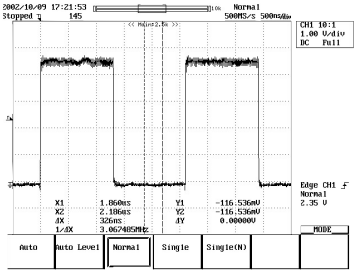
• R309 → SURROUND L

4)



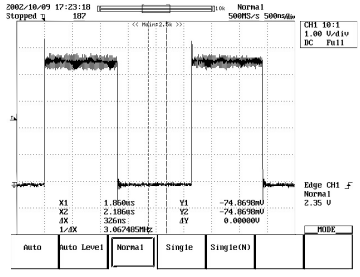
• R301 → SURROUND R

5)



• R307 → CENTER

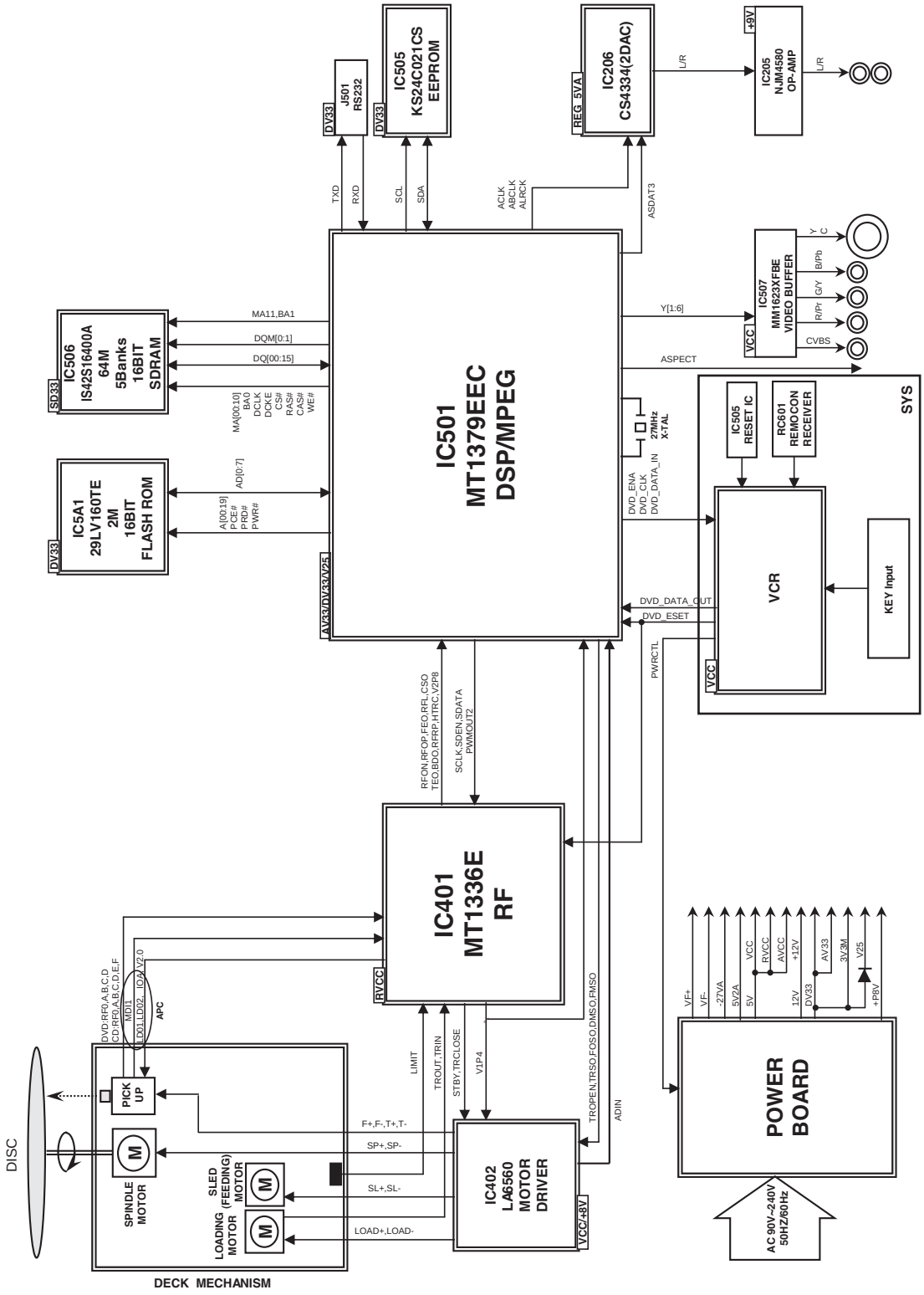
6)



• R305 → WOOFER

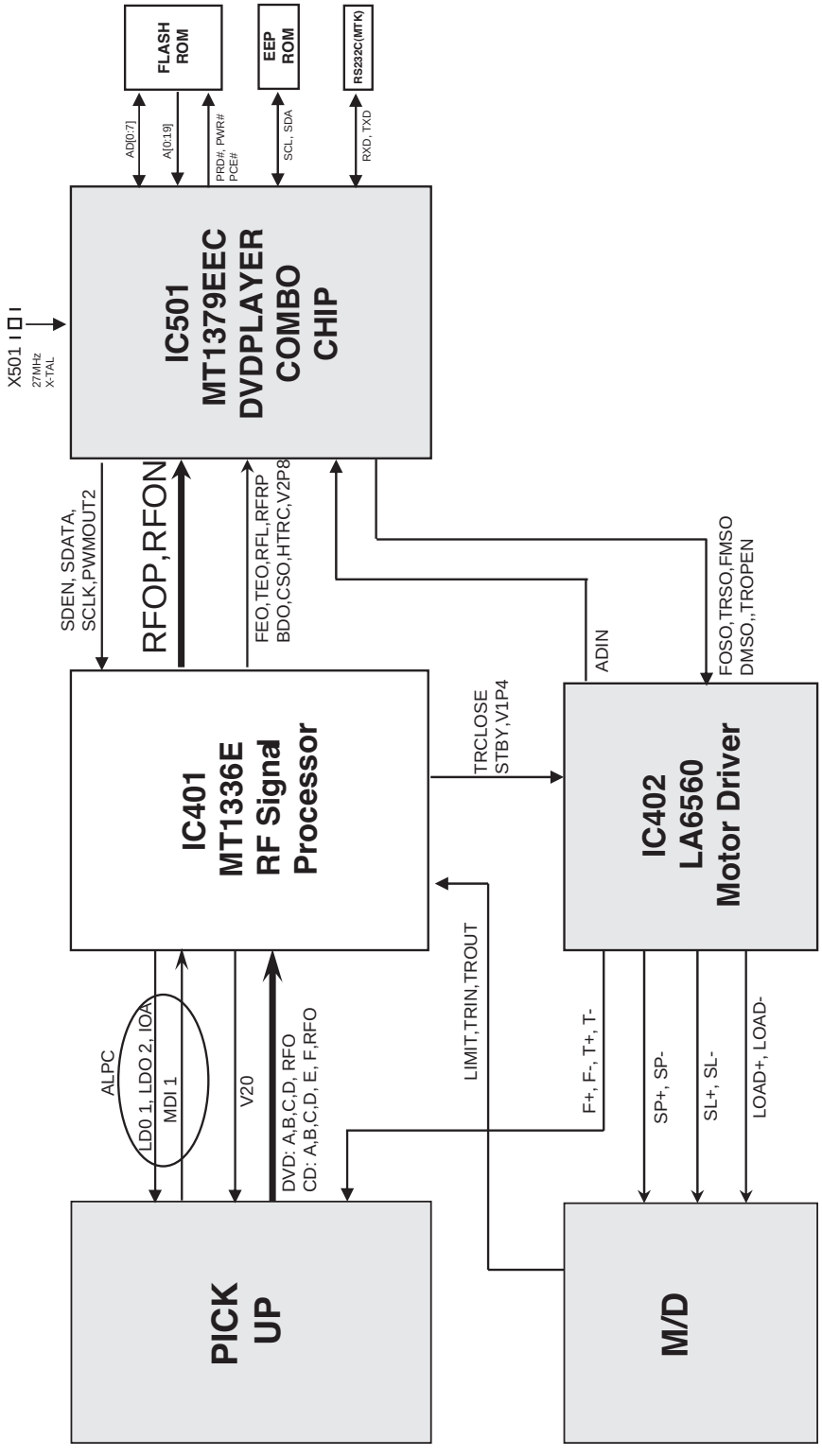
BLOCK DIAGRAMS

1. Overall Block Diagram



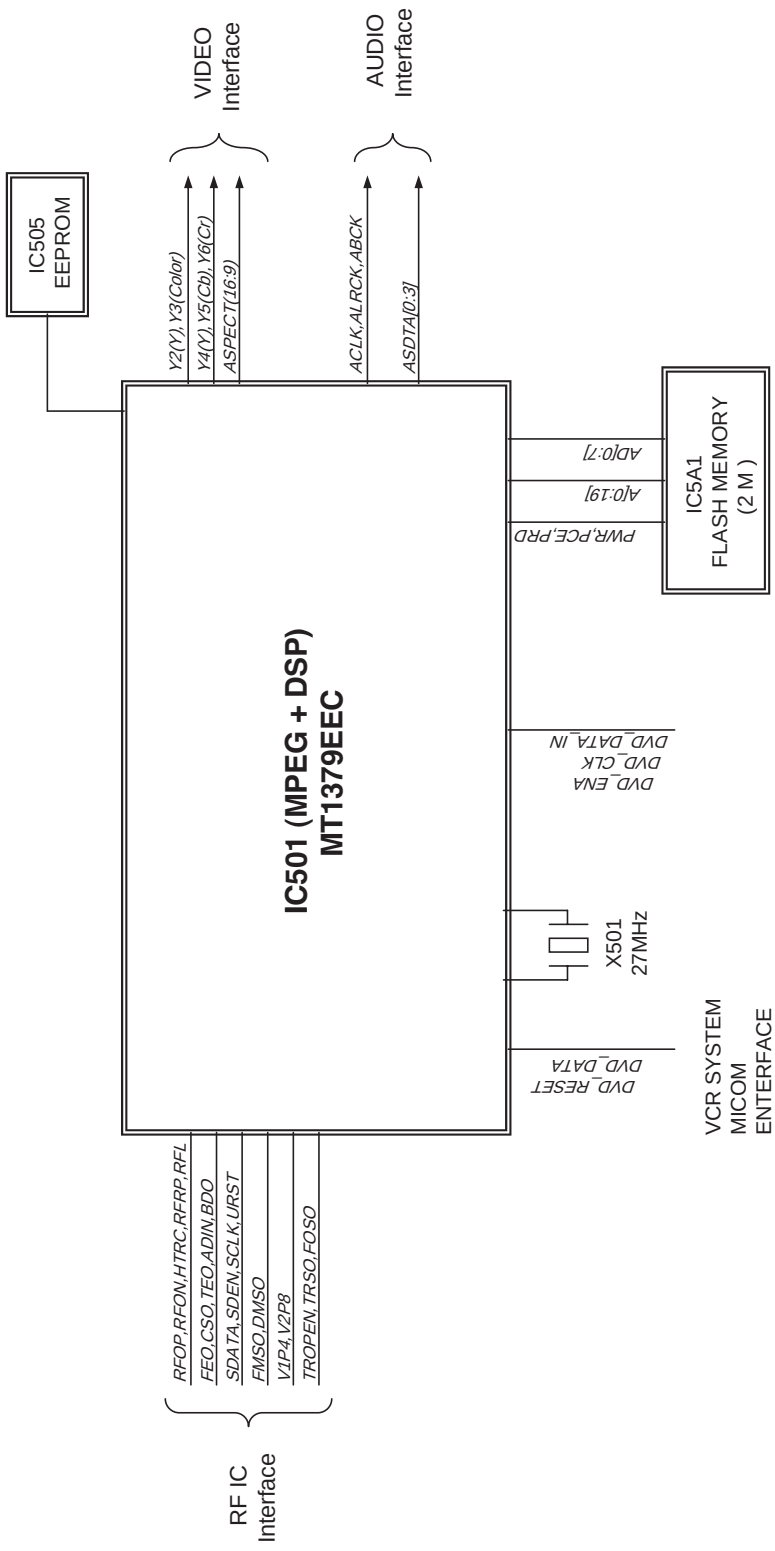
TOSHIBA
LH-C444M

2. SERVO Block Diagram



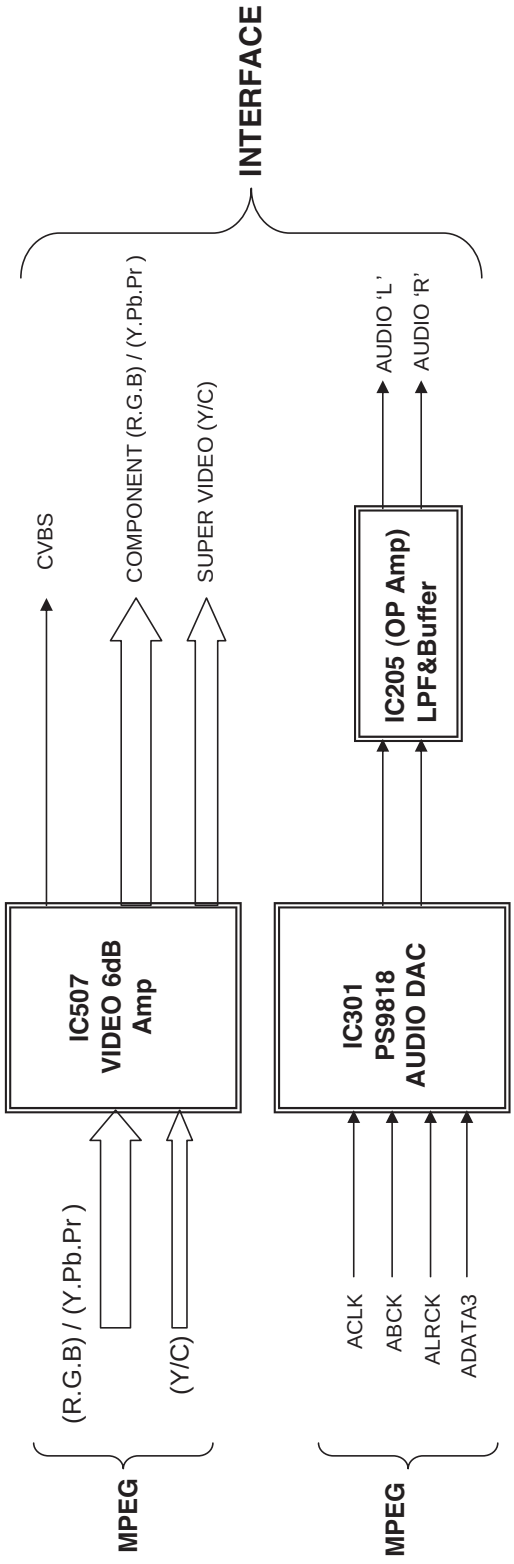
TOSHIBA
LH-C444M

3. MPEG & MEMORY Block Diagram

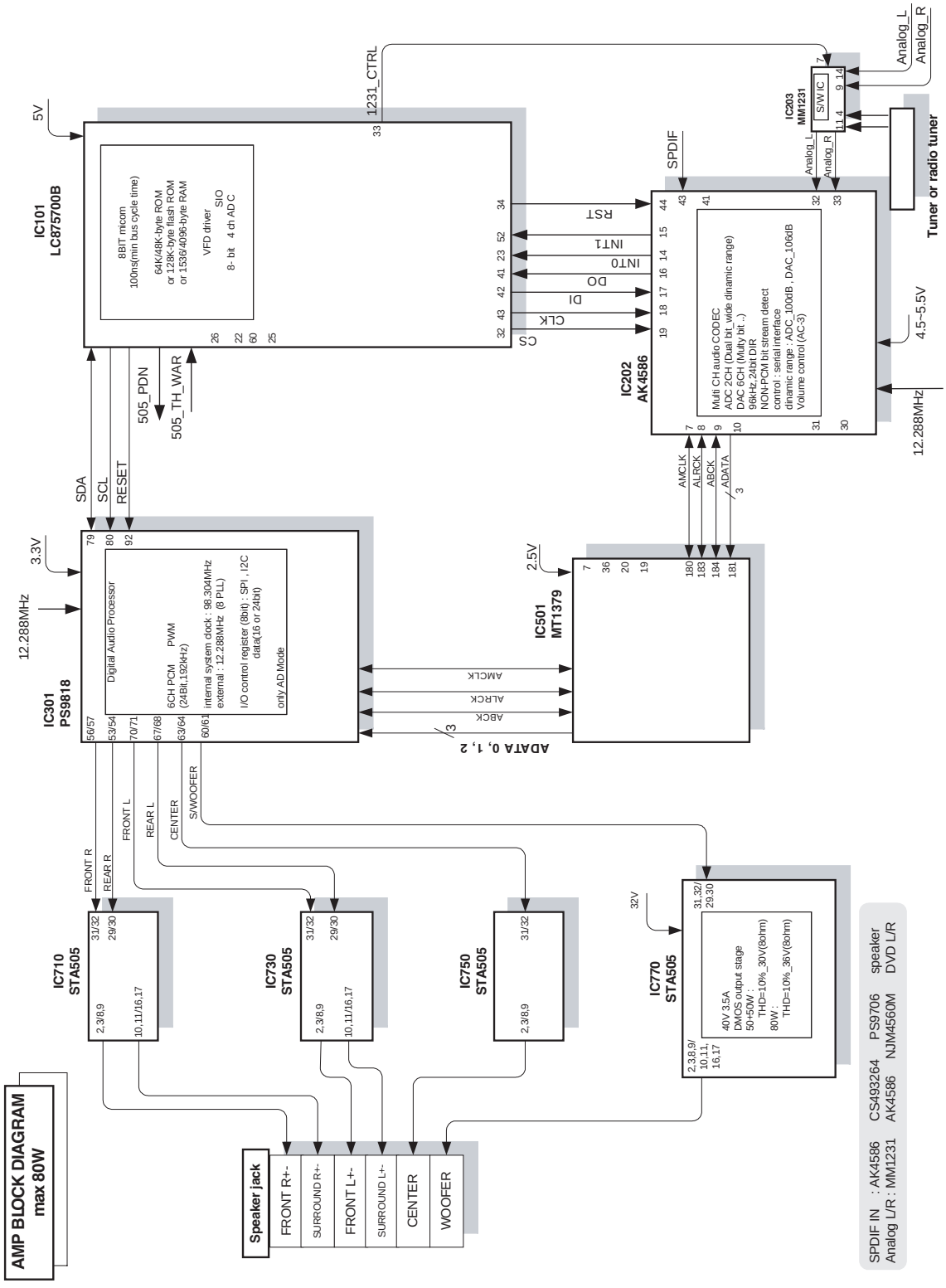


TOSHIBA
LH-C444M

4. VIDEO & AUDIO Block Diagram



5. DVD & AMP Block Diagram

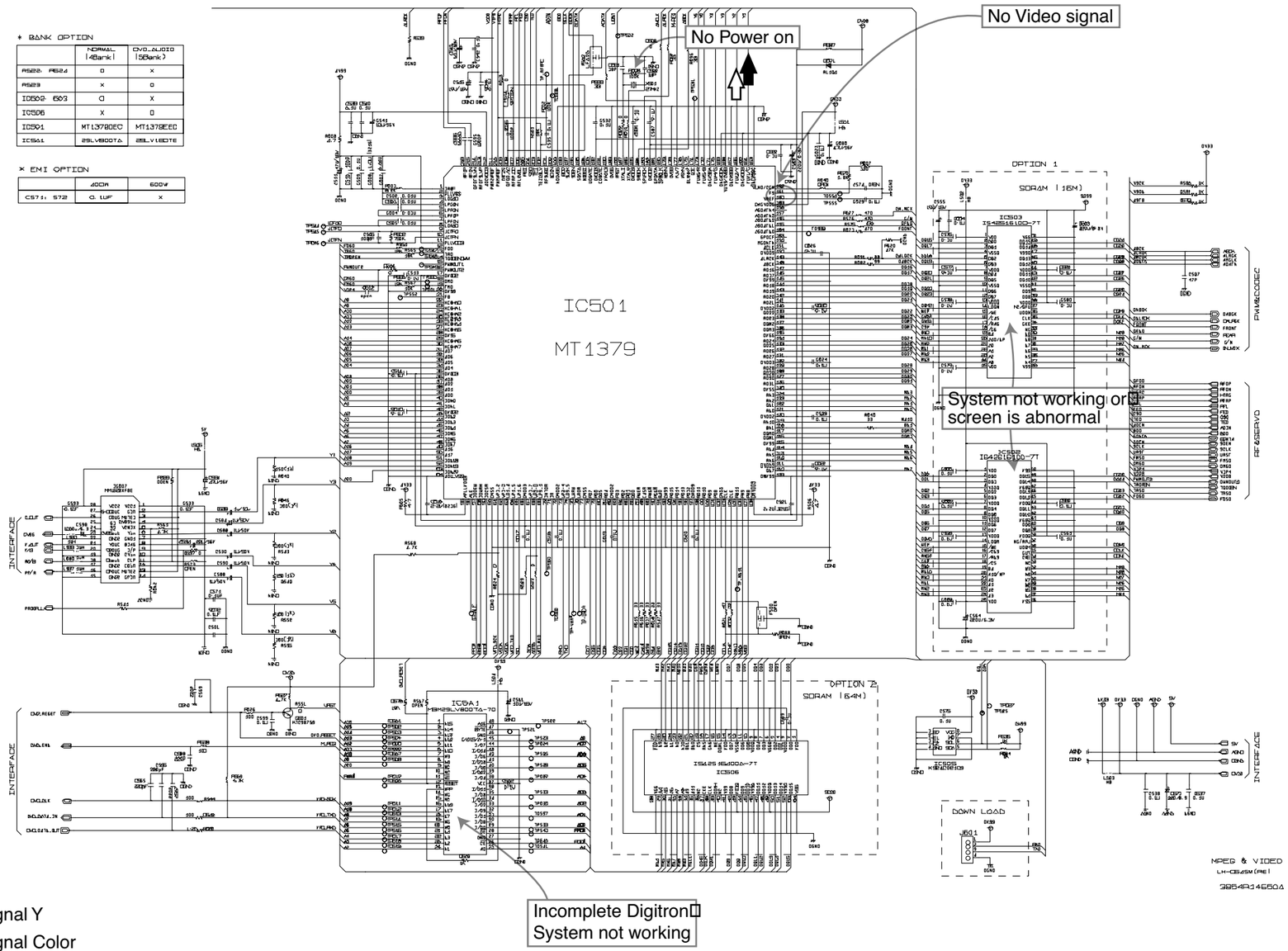


TOSHIBA
LH-C444M

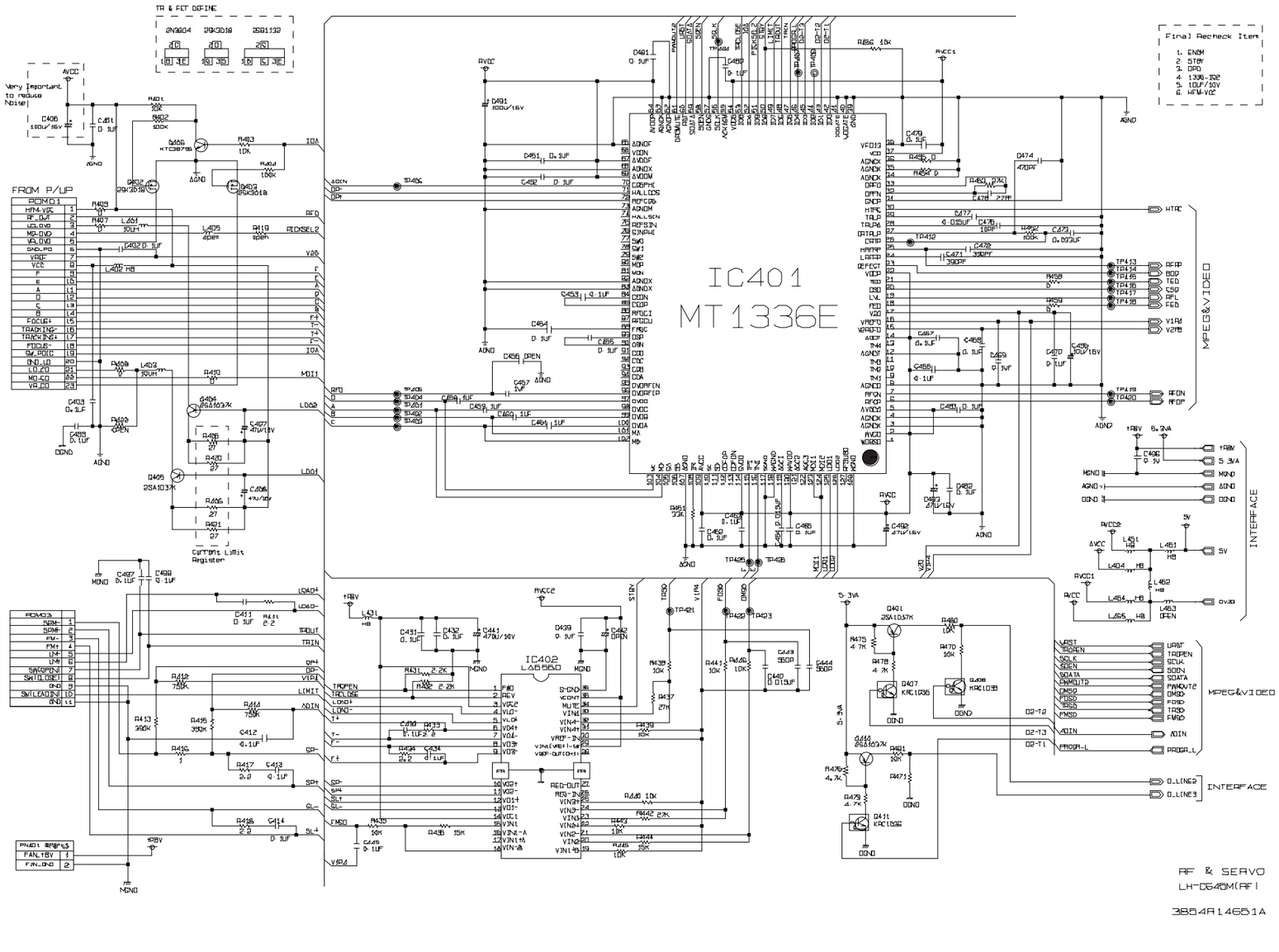
MEMO

CIRCUIT DIAGRAMS

1. MPEG CIRCUIT DIAGRAM



2. RF & SERVO CIRCUIT DIAGRAM



3. AUDIO, μ_COM CIRCUIT DIAGRAM(DVD & AMP)

x RADIO TUNER OPTION TABLE(TU1D1)

RDS	10KHZ FILTER	FM TUNER	AREA	BAND	FREQ. RESP.	FM MOD.	FM ANT.	KWANGSUNG PART NO.	LG PART NO.
X	X	2/3BAND/FDC	USA/S.AMERICA	FM/MW	75uS	75KHz	75Ohm	KST-MLD09MVD-60L	6700FM0091A
X	X	2/3GANG/FDC	AUS-/ASIA	FM/MW	50uS	40KHz	75Ohm	KST-MLD09MV1-60L	6700FM0092A
X	X	3BAND/3DST	AUS-/CIS(AX)	FM/MW	50uS	40KHz	75Ohm	KST-MLD02MV1-60L	6700FM0094A
X	X	4BAND	TURKEY(AD)	FM/MW/L/M	50uS	75KHz	760MB	KST-MLD04MV1-60L	6700FM0095A
O	X	4BAND/CE	EU(AD)	FM/MW	50uS	40KHz	760MB	KST-ML04MV1-60L	6700FM0096A
X	X	3BAND	JAPAN(AX)	FM/MW	75uS	40KHz	760hm	KST-MLD03MVD-61L	6700FM0097A
X	X	4BAND	CANARRY(AD)	FM/MW	50uS	75KHz	760hm	KST-MLD04MV1-60L	6700FM0098A
X	X	4GANG	KOREA(AX)	FM/MW	75uS	75KHz	75Ohm	KST-MLD04MVD-61L	6700FM0099A

TUNER_L

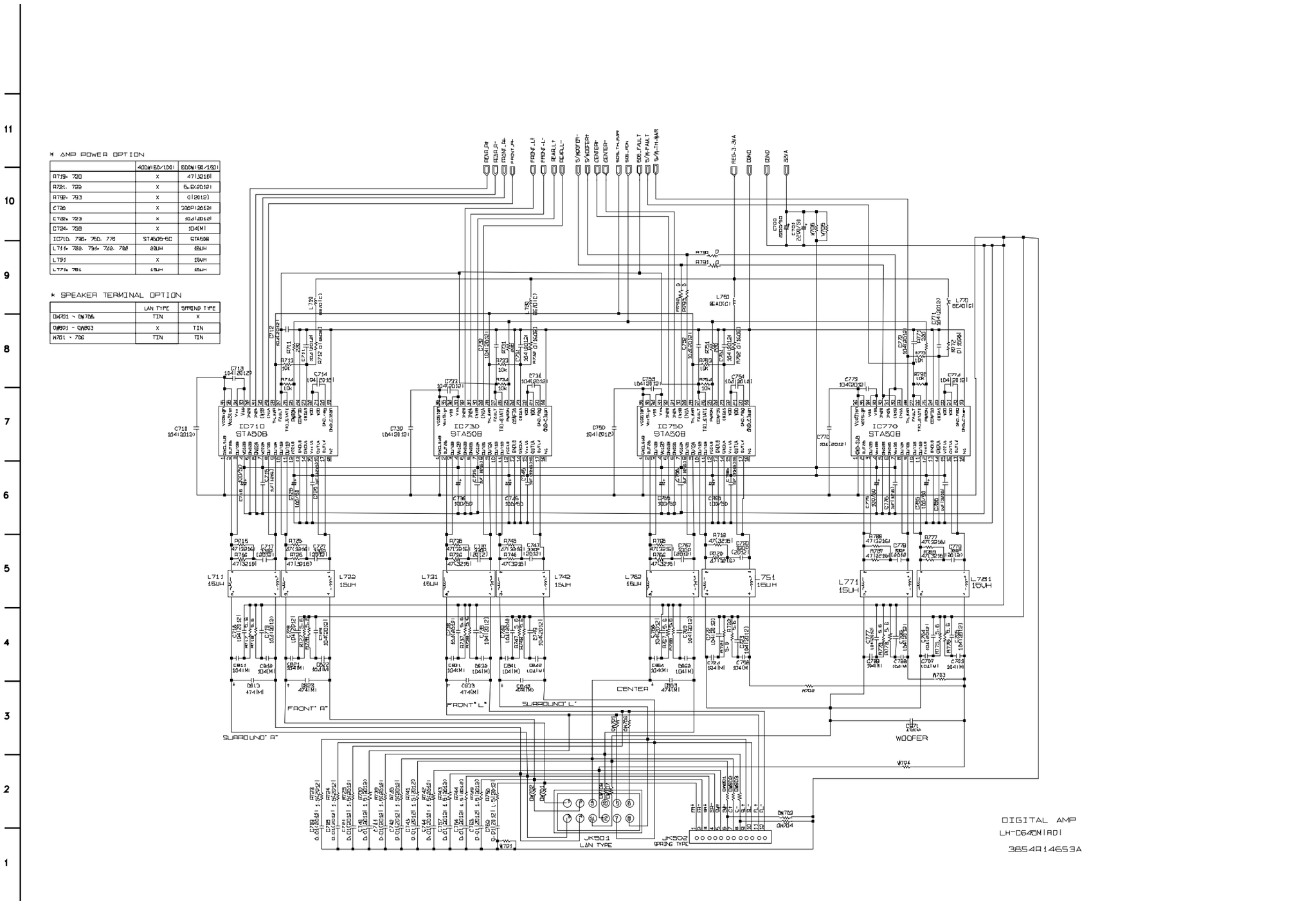
TUNER_R

AUDIO MICOM

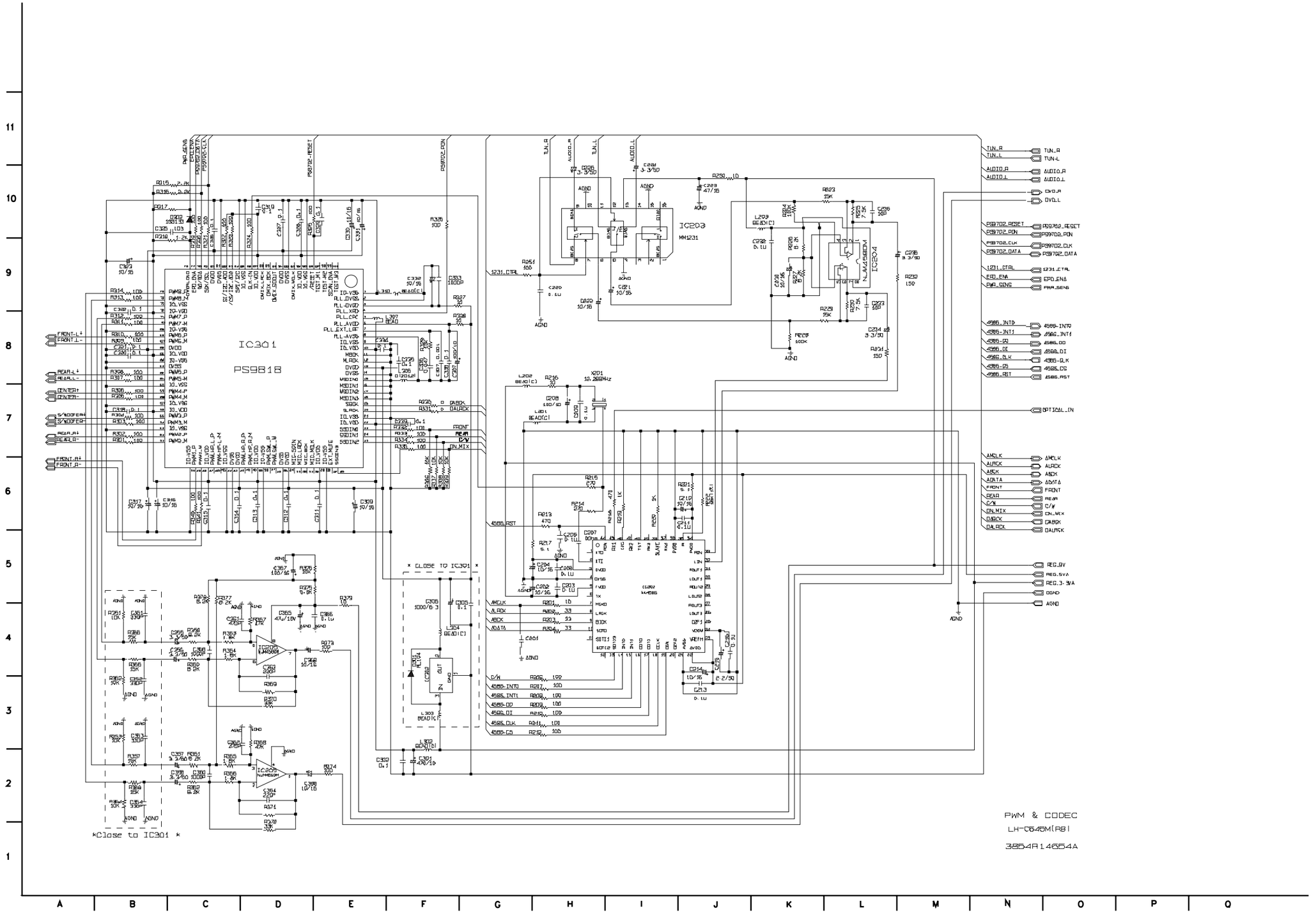
LH-C845M(DN)

3854A14652A

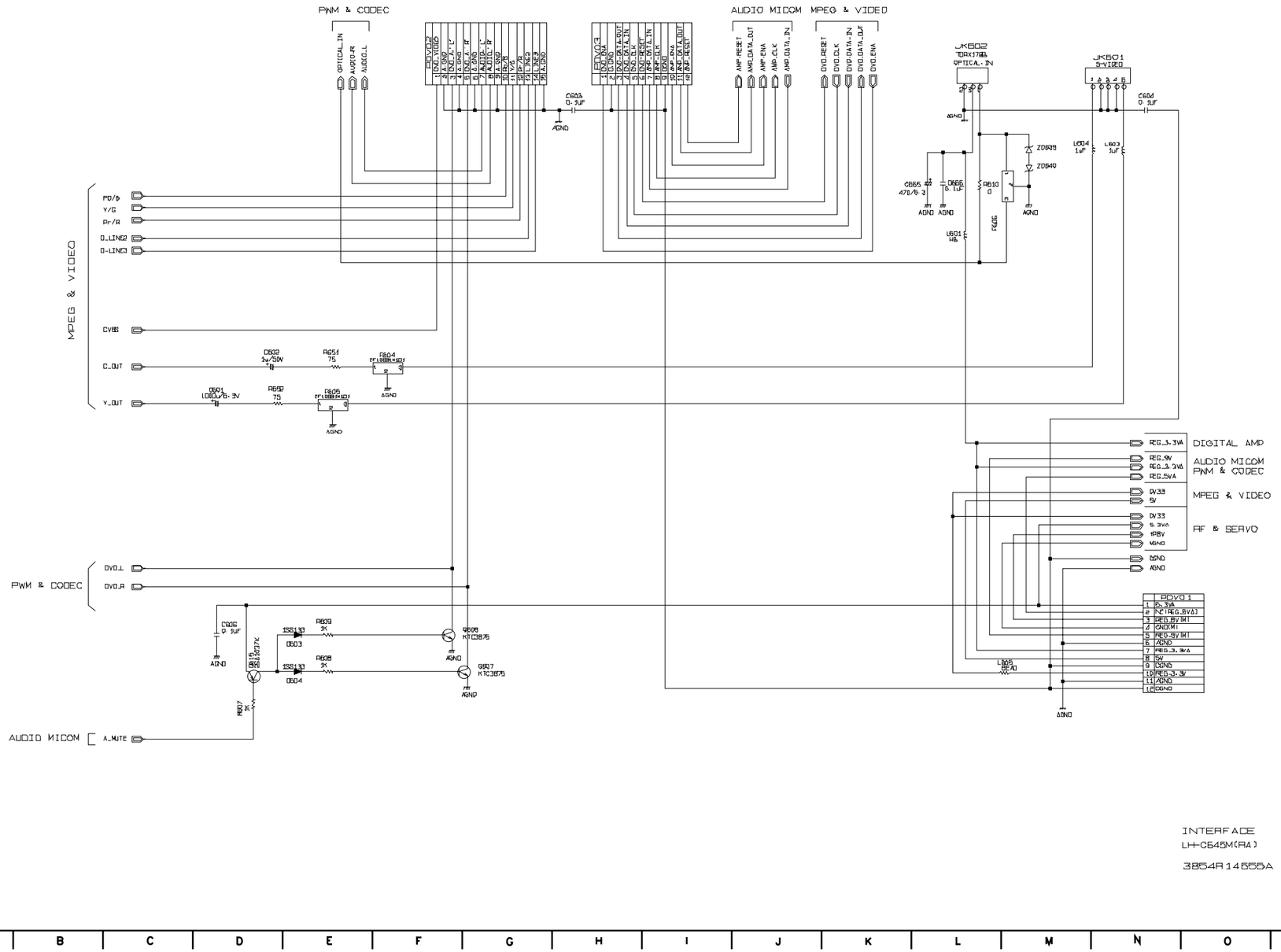
4. DIGITAL AMP CIRCUIT DIAGRAM (DVD & AMP)



5. PWM & CODEIC CIRCUIT DIAGRAM (DVD & AMP)



6. INTERFACE CIRCUIT DIAGRAM (DVD & AMP)



• CIRCUIT VOLTAGE CHART

MODE / PIN NO.	STOP	PLAY
IC101		
1	5.23	5.22
2	0	0
3	1.75	1.99
4	0	0
5	4.91	4.91
6	NC	NC
7	0.54	1.88
8	0.54	1.88
9	4.91	4.91
10	0	0
11	4.77	4.77
12	0.12	0.12
13	4.72	4.72
14	0	0
15	0	0
16	0	0
17	0	0
18	0	0
19	0	0
20	0	0
21	0	0
22	3.24	3.22
23	0.91	0.91
24	1.65	1.65
25	0	0
26	0	0
27	1.99	1.93
28	3.12	3.12
29	3.26	3.25
30	3.12	3.12
31	4.65	4.65
32	NC	NC
33	NC	NC
34	NC	NC
35	0	0
36	4.91	4.91
37	3.25	3.24
38	4.91	4.91
39	0	0
40	3.22	3.2
41	NC	NC
42	NC	NC
43	NC	NC
44	NC	NC
45	NC	NC
46	4.91	4.9
47	2.08	2.03
48	2.07	2.07
49	4.91	4.9
50	NC	NC
51	5.09	5.08
52	0	0
53	4.91	4.91
54	2.16	2.1

MODE / PIN NO.	STOP	PLAY
55	2.04	1.96
56	0	0
57	2.36	2.36
58	2.42	2.42
59	4.9	4.91
60	2.4	2.4
61	1.8	1.9
62	4.9	4.9
63	0	0
64	5.23	5.22
IC102		
1	4.93	4.93
2	0	0
3	4.93	4.93
IC202(AK4586)		
1	2.41	2.39
2	2.04	2.07
3	4.85	4.84
4	0	0.01
5	3.28	3.28
6	4.85	0.01
7	1.18	1.15
8	1.65	1.65
9	1.63	1.62
10	1.3	1.25
11	0	1.63
12	0	1.63
13	0	0.58
14	0	0.03
15	0	0.03
16	0.45	0.2
17	0	0.01
18	0	0.02
19	4.93	4.92
20	0	0.02
21	0	0.01
22	4.94	4.93
23	4.93	4.93
24	2.46	2.46
25	0	0.02
26	2.47	2.47
27	2.47	2.47
28	2.47	2.47
29	2.47	2.47
30	2.47	2.47
31	2.47	2.47
32	2.47	2.46
33	2.47	2.46
34	4.93	4.92
35	1.2	1.2
36	0	0.01
37	2.44	2.45
38	0	0.01
39	2.44	2.45
40	0	0.02

MODE / PIN NO.	STOP	PLAY
41	2.44	2.45
42	0	0.01
43	4.24	4.23
44	4.93	4.93
IC301		
1	0	0
2	0	0
3	3.21	3.18
4	4.91	4.91
5	3.21	3.18
6	2.95	2.92
7	1.72	1.7
8	0	0
9	0	0
10	0	0
11	0	0
12	0	0
13	0	0
14	0	0
15	3.21	3.18
16	0	0
17	0	0.9
18	0	0
19	0	0
20	0	0
21	0	0.9
22	1.59	1.6
23	1.63	1.62
24	3.22	3.18
25	0	0
26	0	0.9
27	0	0
28	0	0
29	0	0
30	NC	NC
31	NC	NC
32	3.21	3.18
33	0	0
34	NC	NC
35	NC	NC
36	NC	NC
37	0	0
38	1.6	1.59
39	NC	NC
40	3.21	3.18
41	0	0
42	NC	NC
43	0	0
44	NC	NC
45	NC	NC
46	3.21	3.18
47	0	0
48	NC	NC
49	NC	NC
50	0	0

MODE / PIN NO.	STOP	PLAY
51	3.21	318
52	0	0
53	1.59	1.58
54	1.59	1.58
55	0	0
56	1.59	1.58
57	1.59	1.58
58	3.21	3.18
59	0	0
60	1.59	1.58
61	1.59	1.58
62	0	0
63	1.59	1.58
64	1.59	1.59
65	3.21	3.18
66	0	0
67	1.59	1.58
68	1.59	1.58
69	0	0
70	1.59	1.58
71	1.59	1.58
72	3.21	3.18
73	0	0
74	0	0
75	0	0
76	3.1	3.09
77	3.21	3.18
78	0	0
79	3.22	3.2
80	0	0
81	3.21	3.18
82	3.21	3.18
83	0	0
84	3.21	3.18
85	0	0
86	1.67	1.67
87	NC	NC
88	NC	NC
89	0	0
90	3.21	3.18
91	0	0
92	3.25	3.24
93	0	0
94	0	0
95	0	0
96	0	0
97	NC	NC
98	0	0
99	3.21	3.18
100	0	0
IC401(MT1336E)		
1	1.03	2.99
2	5.11	5.08
3	0	0
4	0	0

MODE / PIN NO.	STOP	PLAY
5	5.11	5.07
6	0	1.95
7	0	0
8	0	0
9	5.11	0
10	5.11	5.08
11	5.11	5.08
12	0	0
13	5.11	0
14	5.11	5.08
15	2.84	2.81
16	1.45	1.43
17	2.08	2.07
18	1.37	1.42
19	0.69	2.3
20	2.4	0
21	2.35	0
22	5.11	5.08
23	0	0
24	2.59	3.2
25	0.19	1.88
26	1.58	0
27	2.56	3.13
28	2	2.01
29	2	2.06
30	2.96	1.52
31	0	0
32	0.06	2.07
33	0.07	2.07
34	0	0
35	0	0
36	0	0
37	5.13	0
38	0	0
39	0	0
40	0	0
41	0	0
42	5.12	5.09
43	5.12	5.09
44	5.12	5.09
45	5.12	5.09
46	5.12	5.09
47	0	0
48	5.12	5.09
49	5.12	0
50	5.08	5.06
51	5.09	5.07
52	5.1	0
53	0	0
54	5.13	0
56	1.61	0
57	0	0
58	0	0
59	0	0
60	0	0

MODE / PIN NO.	STOP	PLAY
61	3.28	0
62	0	0
63	0	0
64	0	0
65	0	0
66	0.026	0
67	5.12	5.08
68	0	0
69	5.12	0
70	3.21	2.03
71	3.46	2.2
72	2.81	0
73	0	0
74	0.21	0.09
75	0.22	0
76	0	0.1
77	0.21	0.09
78	0.23	0.09
79	0.21	0.08
80	0.23	0.08
81	0.22	0
82	0	0
83	0	0
84	0.07	0
85	0.07	2.27
86	1.97	0
87	1.96	1.9
88	1.54	1.71
89	0.19	2.22
90	0.21	0
91	0.22	0.06
92	0.22	0
93	0.23	0.06
94	0.23	0.06
95	2.28	0
96	2.28	2.25
97	2.27	1.23
98	2.27	2.23
99	2.27	2.23
100	2.16	2.23
101	2.08	2.17
102	2.07	2.17
103	2.07	2.18
104	2.08	0
105	0.13	0.15
106	0.14	0.16
107	0	0
108	1.28	1.28
109	5.18	5.05
110	0.14	0.16
111	0.15	0.15
112	0.13	0.16
113	0.14	0.15
114	5.1	5.05
115	2.07	2.06

MODE / PIN NO.	STOP	PLAY
116	2.06	2.09
117	0	0
118	0	0
119	0	0
120	5.1	5.05
121	0.13	0.15
122	0.14	0.15
123	0	0.18
124	0	0.18
125	5.08	5.03
126	5.08	3.16
127	0.06	2.08
128	0	0
IC402 (LA6560)		
1	0	0
2	0	0
3	8.04	8.01
4	0.12	0.06
5	0	0.06
6	3.64	3.69
7	3.62	3.61
8	3.64	3.53
9	3.6	3.76
10	3.62	2.43
11	3.63	4.85
12	3.62	3.72
13	3.64	3.57
14	8.04	8.01
15	1.45	1.48
16	0.27	1.39
17	0.29	1.32
18	1.45	1.43
19	1.45	1.43
20	1.45	0.82
21	1.45	1.43
22	1.45	1.43
23	1.47	1.37
24	1.45	1.43
25	1.45	1.43
26	0.95	0.9
27	0	0
28	1.45	1.43
29	5.15	5.11
30	1.45	1.43
31	1.45	1.43
32	1.45	1.43
33	1.46	1.45
34	5.08	5.06
35	5.15	5.11
36	0	0
IC402 (LA6560)		
1	1.22	1.22
2	0	0
3	0.96	0.9
4	2	2.06

MODE / PIN NO.	STOP	PLAY
5	0	1.51
6	1.48	1.47
7	0	1.56
8	3.2	1.52
9	0.12	0.06
10	0.12	0.06
11	3.25	3.25
12	1.41	1.49
13	1.41	1.41
14	0	0
15	1.42	1.42
16	3.3	0
17	2.53	2.53
18	1.42	2.27
19	1.42	1.39
20	0	0
21	2.61	2.58
22	0.75	1.46
23	2.83	1
24	1.9	0.89
25	1.72	0.39
26	0.68	0.31
27	2.84	3.16
28	0	0
29	2.85	0.66
30	1.83	0.49
31	0.91	1.39
32	1.43	1.2
33	1.51	1.57
34	1.51	1.43
35	3.3	3.29
36	0.81	1.26
37	1.45	1.02
38	1.82	1.6
39	1.2	1.5
40	2	2.06
41	2.17	1.95
42	2.53	2.52
43	1.96	1.9
44	1.79	1.9
45	0.8	1.72
46	0.8	1.96
47	0.8	1.84
48	3.3	2.63
49	0	0.13
50	0	0.07
51	0	0
52	0	0
53	0	0
54	0	0
55	3.25	3.27
56	1.2	1.18
57	0	0
58	3.29	3.29
59	0	0

MODE / PIN NO.	STOP	PLAY
60	0	0
61	2.59	2.57
62	2.58	2.58
63	0	0
64	2.59	2.56
65	3.29	3.29
66	3.3	3.29
67	3.29	3.29
68	2.57	2.56
69	5.19	5.18
70	2.59	2.57
71	0.12	0.08
72	2.53	2.52
73	2.59	2.57
74	3.29	3.29
75	2.61	2.61
76	3.27	3.24
77	0	0
78	0.94	1.04
79	0.78	1.06
80	0.89	1.15
81	0.99	1.34
82	2.52	2.52
83	3.09	1.33
84	0.37	1.16
85	3.08	1.1
86	3.07	1.08
87	0.59	1.04
88	1.57	2.53
89	3.2	3.13
90	2.77	2.53
91	0.22	1.68
92	0	0
93	3.32	1
94	0.16	1.58
95	3.31	1.62
96	3.3	1.08
97	3.3	3.29
98	3.32	1.62
99	0.16	1.09
100	3.32	1.27
101	3.3	1.32
102	0	0
103	1.56	1.55
104	0.94	1.25
105	0.41	0
106	0.05	0.06
107	0	0.06
108	3.27	3.26
109	0	0
110	0.19	1.74
111	3.3	3.29
112	0.18	1.62
113	2.98	2.38
114	3.02	1.48

MODE / PIN NO.	STOP	PLAY
115	0	0
116	2.86	3.01
117	2.86	2.54
118	0	0
119	0	2.5
120	2.55	2.51
121	3.03	1.4
122	3.03	1.4
123	0.22	1.39
124	0.22	0.34
125	0	0
126	3.31	0.98
127	0.26	1.64
128	3.31	1.53
129	3.3	1.15
130	3.3	3.29
131	3.31	1.49
132	0.16	0.89
133	3.3	0
134	3.3	1.07
135	0	0
136	2.86	2.53
137	2.86	2.53
138	0.07	0.86
139	0.09	0.99
140	0.07	2.51
141	0.07	0.94
142	0.09	1.13
143	0.07	1.19
144	0.09	1.07
145	0.09	0
146	0	1.51
147	0.09	1.25
148	0.07	1.64
149	0.06	0
150	0	1.65
151	0.07	3.29
152	0	1.6
153	0	1.64
154	0	1.44
155	0	0
156	0	0
157	0	1.63
158	0	3.29
159	0	3.27
160	0	1.27
161	0	1.27
162	0	2.35
163	0	0
164	0	0.73
165	0	3.27
166	0	0.5
167	0	0
168	0	0.53
169	0	3.27

MODE / PIN NO.	STOP	PLAY
170	0	0.59
171	0	0
172	3.01	0.72
173	0	0.72
174	0	0
175	0	2.73
176	0	3.13
177	0	3.13
178	0	3.25
179	0	0
180	0	0
181	2.04	2.64
182	0	2.52
183	0	0
184	0	0.09
185	0	3.26
186	_	_
187	0	0.08
188	0	0
189	0	0
190	0	0
191	0.23	0
192	0	3.29
193	0	0
194	0	0
195	0	0
196	0	0
197	0	1.63
198	0	0
199	0	0
200	0	2.15
201	0	1.44
202	0	1.44
203	0	1.43
204	0	1.43
205	0	1.42
206	0	2.1
207	0	2.07
208	0	1.41
209	0	1.52
210	0	1.43
211	0	2.81
212	0	3.28
213	0	0.12
214	0	0.12
215	1.02	1.43
216	0	1.43
IC505(EEPROM)		
1	0	0
2	0	0
3	0	0
4	0	0
5	3.28	3.29
6	3.28	3.29
7	0	0

MODE / PIN NO.	STOP	PLAY
8	3.28	3.29
IC507(MM1623)		
1	5.09	5.08
2	2.43	2.42
3	5.09	5.08
4	1.45	0
5	0	0
6	1.45	1.69
7	0	0
8	2.47	2.46
9	0	0
10	1.14	1.76
11	0	0
12	2.42	2.42
13	5.09	5.08
14	2.43	2.42
15	0	0
16	2.49	2.47
17	0	0
18	2.48	2.47
19	0	0
20	1.18	2.3
21	1.76	2.17
22	0	0
23	1.76	2.24
24	0	0
25	0	0
26	0	0
27	0.06	0.05
28	5.09	0
IC510(BUFFER)		
1	0	0
2	2.59	2.55
3	0	0
4	2.59	2.56
5	0	0
6	3.24	3.23
7	0	0
8	0.14	0.08
9	0	0
10	0	0
11	0.15	0.09
12	0	0
13	0.15	0.08
14	5.19	5.19
15	0.14	0.09
16	5.25	5.24
17	0.15	0.08
18	5.23	5.23
19	0	0
20	5.25	5.25
IC5A1(FLASH)		
1	0.08	0.16
2	1.82	0.45
3	2.84	0

MODE / PIN NO.	STOP	PLAY
4	2.83	3.12
5	0.69	0.26
6	1.72	0.25
7	1.92	0.9
8	1.7	1.45
9	0	0
10	0	0
11	3.27	3.29
12	3.56	3.55
13	3.29	3.29
14	0	0
15	0.23	0.06
16	0	0
17	0	0
18	0	0.87
19	1.98	2.64
20	2.28	2.18
21	2.13	1.96
22	1.67	2.01
23	1.99	1.72
24	1.93	2.19
25	2.05	1.94
26	0	0
27	0	0
28	0	0
29	1.49	2.03
30	0.16	1.07
31	1.96	1.25
32	0.16	1.1
33	0.99	2.2
34	1.17	1.07
35	0.79	1.82
36	0.15	1.07
37	3.29	3.3
38	1.93	3.09
39	0.16	1.07
40	1.5	2.2
41	0.16	1.07
42	1.21	2.64
43	0.16	1.08
44	1.64	1.48
45	2.05	2.06
46	0	0
47	0	0
48	0.07	0.13
IC710		
1	0	0
2	15.6	15.6
3	15.6	15.6
4	3.59	31.58
5	0	0
6	0	0
7	31.59	31.58
8	15.62	15.62
9	15.62	15.62

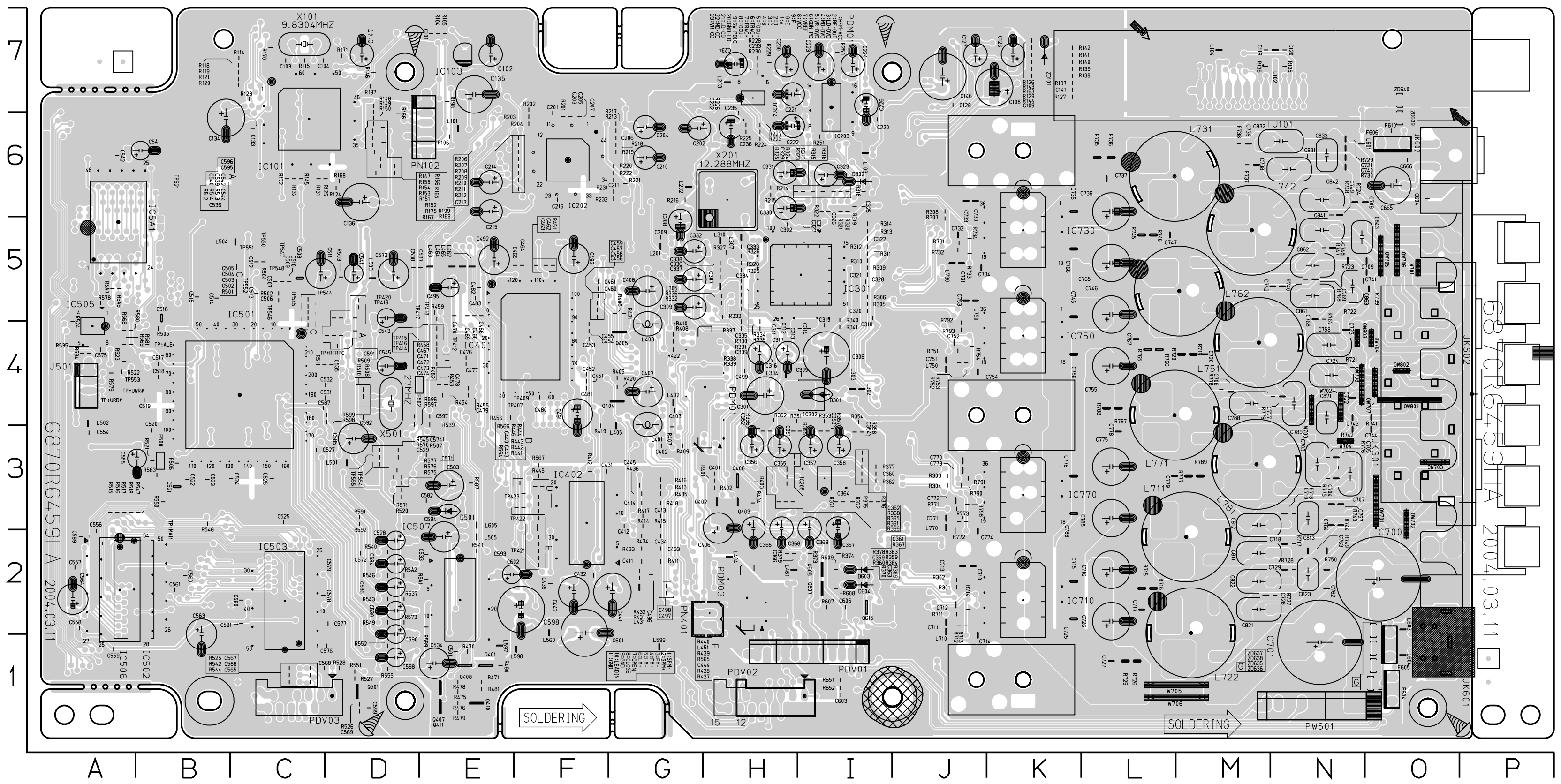
MODE / PIN NO.	STOP	PLAY
10	15.61	15.61
11	15.61	15.61
12	31.59	31.59
13	0	0
14	0	0
15	31.59	31.59
16	15.61	15.61
17	15.61	15.61
18	NC	NC
19	0	0
20	0.02	0.02
21	5.02	5.02
22	5.02	5.02
23	3.25	3.24
24	0	0
25	3.15	3.15
26	3.15	3.15
27	3.15	3.15
28	3.24	3.23
29	1.58	1.57
30	1.58	1.57
31	1.58	1.57
32	1.58	1.57
33	26.32	26.31
34	26.32	26.31
35	31.58	31.57
36	31.58	31.57
IC730		
1	0	0
2	15.6	15.6
3	15.6	15.6
4	31.59	31.58
5	0	0
6	0	0
7	31.59	31.58
8	15.62	15.62
9	15.62	15.62
10	15.61	15.61
11	15.61	15.61
12	31.59	31.59
13	0	0
14	0	0
15	31.59	31.59
16	15.61	15.61
17	15.61	15.61
18	NC	NC
19	0	0
20	0.02	0.02
21	5.02	5.02
22	5.02	5.02
23	3.24	3.23
24	0	0
25	3.15	3.15
26	3.15	3.15
27	3.15	3.15

MODE / PIN NO.	STOP	PLAY
28	3.24	3.23
29	1.58	1.57
30	1.58	1.57
31	1.58	1.57
32	1.58	1.57
33	26.3	26.3
34	26.3	26.3
35	31.58	31.57
36	31.58	31.57
IC750		
1	0	0
2	15.6	15.6
3	15.6	15.6
4	31.59	31.58
5	0	0
6	0	0
7	31.59	31.58
8	15.62	15.62
9	15.62	15.62
10	15.61	15.61
11	15.61	15.61
12	31.59	31.59
13	0	0
14	0	0
15	31.59	31.59
16	15.61	15.61
17	15.61	15.61
18	NC	NC
19	0	0
20	0.03	0.03
21	5.06	5.06
22	5.06	5.06
23	3.24	3.23
24	0	0
25	3.15	3.15
26	3.15	3.15
27	3.15	3.15
28	3.24	3.23
29	1.58	1.57
30	1.58	1.57
31	1.58	1.57
32	1.58	1.57
33	26.3	26.3
34	26.3	26.3
35	31.58	31.57
36	31.58	31.57

SECTION	NO	STOP			PLAY		
		B	E	C	B	E	C
DVD&AMP	Q401	5.2	5.19	0	5.2	5.19	0
	Q402	0	0	0	0	0	0.22
	Q403	5.08	0	0	4.93	0	0
	Q404	5.01	5.08	0	4.96	5.02	0
	Q405	5.01	5.08	0.44	3.32	4.01	1.9
	Q407	0	0	5.2	0	0	0
	Q408	2.85	0	0	2.83	0	0
	Q410	5.2	5.2	0	0	5.2	0
	Q411	0	0	5.2	0	0	5.19

PRINTED CIRCUIT DIAGRAMS

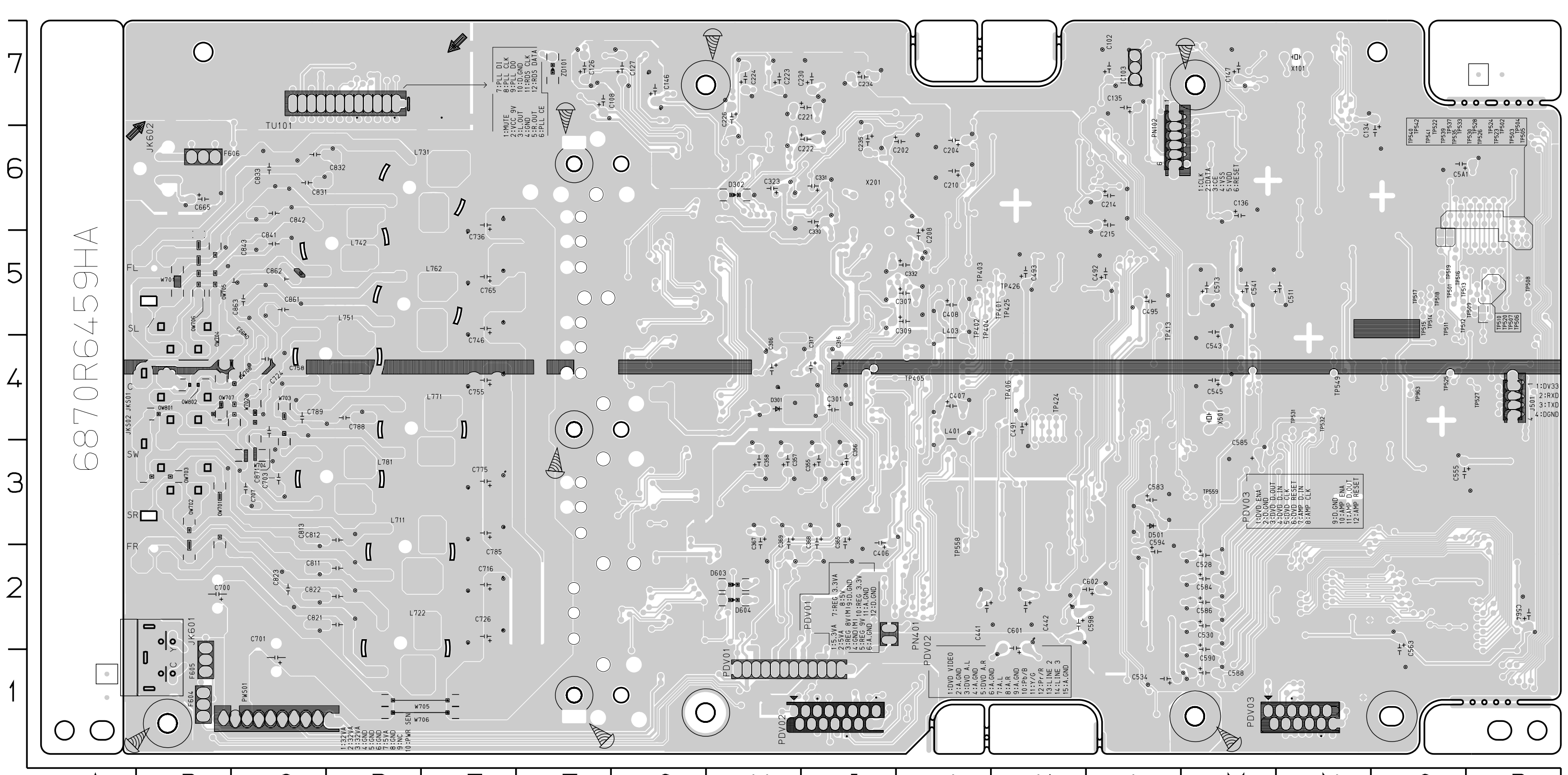
1. DVD & AMP P.C.BOARD



LOCATION GUIDE

C101	E7	C311	H4	C407	G4	C493	F5	C554	A3	C665	O6	C750	J5	D604	I2
C102	E7	C312	H4	C408	G5	C495	E5	C555	B3	C666	O6	C751	J4	F500	B3
C103	C7	C313	I4	C411	G2	C496	G2	C556	A2	C700	O2	C752	J4	F502	E4
C104	C7	C314	I4	C412	G3	C497	G2	C557	A2	C701	N1	C753	J5	F604	O1
C108	K7	C315	I4	C413	G3	C498	G2	C558	A2	C703	N3	C754	J4	F605	O1
C109	K7	C316	H4	C414	G3	C499	H4	C559	A1	C704	N3	C755	L4	F606	O6
C119	M7	C317	H4	C431	F3	C501	E1	C560	B2	C705	N3	C756	K4	IC101	C6
C120	N7	C318	I5	C432	F2	C502	C5	C561	B2	C706	M4	C757	N3	IC103	E7
C126	K7	C319	I5	C433	G2	C503	C5	C563	B1	C707	N3	C758	N4	IC202	F6
C127	J7	C320	I5	C434	G2	C504	C5	C564	A2	C708	O6	C762	N2	IC203	I7
C128	J7	C321	I5	C439	F2	C505	C5	C565	C1	C709	O5	C763	N2	IC204	H7
C133	C6	C322	I5	C440	F3	C506	C5	C566	C1	C710	J2	C764	N3	IC205	I3
C134	B6	C323	I6	C441	G2	C507	C5	C567	C1	C711	J2	C765	L5	IC301	I5
C135	E7	C325	I6	C442	F2	C508	C5	C568	C1	C712	J2	C766	K5	IC302	I4
C136	D6	C326	I6	C443	F3	C509	C5	C569	D1	C713	J2	C767	L4	IC401	F4
C141	K7	C327	I5	C444	F2	C510	C5	C571	E3	C714	J1	C768	N5	IC402	F3
C146	J7	C328	I5	C445	G3	C511	C5	C572	D2	C715	K2	C769	N5	IC501	C4
C147	D7	C329	I6	C451	F4	C512	C5	C573	D5	C716	L2	C770	J3	IC502	A2
C201	F6	C330	H6	C452	F4	C513	C5	C574	D3	C717	L2	C771	J3	IC503	C2
C202	G6	C331	H6	C453	F4	C514	B5	C575	A4	C718	N2	C772	J3	IC505	A4
C203	F6	C332	G5	C454	F4	C515	B5	C576	D1	C719	N3	C773	J3	IC506	A2
C204	G6	C333	H5	C455	F4	C516	B5	C577	D2	C720	M4	C774	J2	IC507	E2
C205	F6	C334	H5	C456	F5	C517	B4	C578	C2	C721	N6	C775	L3	IC5A1	A5
C206	G6	C335	H5	C457	F5	C518	B4	C579	C2	C722	N4	C776	K3	IC710	K2
C207	F6	C336	H5	C458	F5	C519	B4	C580	C2	C723	N4	C777	N4	IC730	K5
C208	G5	C337	H5	C459	F5	C520	B3	C581	C2	C724	N4	C778	L3	IC750	K4
C209	G5	C338	H5	C460	F5	C521	B3	C582	E3	C725	K2	C779	L3	IC770	K3
C210	G6	C339	H5	C461	F5	C522	B3	C583	E3	C726	L2	C785	L3	J501	A4
C211	G6	C351	H3	C462	F5	C523	B3	C584	D2	C727	L1	C786	K3	JK601	O1
C213	F6	C352	H3	C463	F5	C524	C3	C585	D3	C728	M2	C788	M4	JK602	O6
C214	E6	C353	I3	C464	F5	C525	C3	C586	D2	C729	N2	C789	N4	JKS01	P4
C215	E6	C354	I3	C465	F5	C526	C3	C587	C4	C730	J6	C811	M2	JKS02	P4
C216	F6	C355	H3	C466	E5	C527	C3	C588	D1	C731	J5	C812	M3	L101	E6
C220	I6	C356	H3	C467	E4	C528	D2	C589	A2	C732	J5	C813	N3	L102	N7
C221	H7	C357	I3	C468	E5	C529	D3	C590	D1	C733	J6	C821	M2	L103	I6
C222	H6	C358	I3	C469	E5	C530	D2	C591	D4	C734	J5	C822	M2	L104	M7
C223	I7	C359	H3	C470	E5	C531	D4	C592	D4	C735	K6	C823	N2	L201	G5
C224	I7	C360	I3	C471	E4	C532	D4	C593	E2	C736	L6	C831	N6	L202	G6
C226	I7	C361	H3	C472	E4	C533	E2	C594	E2	C737	L6	C832	N6	L203	H7
C230	H7	C362	I3	C473	E4	C534	E1	C595	D5	C738	M6	C833	N6	L302	I4
C232	H7	C363	H3	C474	E4	C535	D4	C596	D5	C739	M6	C841	N5	L303	I4
C233	H7	C364	I3	C476	E4	C536	D4	C597	E4	C740	N6	C842	N6	L304	H4
C234	H7	C365	H3	C477	E4	C537	E5	C598	F2	C741	O5	C843	N5	L305	H5
C235	H6	C366	H2	C478	E4	C538	D5	C599	D1	C742	N5	C861	N5	L307	H5
C236	H6	C367	I3	C479	E4	C539	D5	C5A1	B6	C743	N4	C862	N5	L310	H5
C301	H4	C368	H3	C480	F4	C540	D5	C5A2	A6	C744	O3	C863	N5	L401	G4
C302	H5	C369	I3	C481	F4	C541	D5	C601	F2	C745	K5	C871	N4	L402	G4
C305	I4	C401	H3	C482	E5	C542	D5	C602	E2	C746	L5	D301	I4	L403	G4
C306	I4	C402	G3	C483	E5	C543	D5	C603	I1	C747	L5	D302	I6	L404	H2
C307	G5	C403	G4	C491	F4	C544	D4	C604	O6	C748	N5	D501	E3	L405	G3
C309	G5	C406	H3	C492	E5	C545	D4	C606	I2	C749	N6	D603	I2	L431	G2

L451	F3	Q402	H3	R156	D6	R305	I5	R365	I3	R445	F3	R542	C1	R715	L2	R779	N4
L461	H2	Q403	H3	R163	K7	R306	I5	R366	I3	R446	F3	R543	D2	R716	L2	R787	L4
L462	E5	Q404	G4	R165	D6	R307	J5	R367	H3	R451	F5	R544	C1	R717	N2	R788	L4
L463	E5	Q405	G4	R166	D6	R308	J6	R368	I3	R452	E4	R545	D3	R718	N3	R789	M3
L464	E5	Q406	H3	R167	D6	R309	I5	R369	H3	R453	E4	R546	D2	R719	M4	R790	J3
L465	E5	Q407	E1	R168	D6	R310	I5	R370	H3	R454	E4	R547	B3	R720	M4	R791	J3
L501	D3	Q408	E1	R169	D6	R311	I5	R371	I3	R455	E4	R548	B3	R721	N4	R792	J4
L502	A4	Q410	E1	R170	C7	R312	I5	R372	I3	R456	E4	R549	D2	R722	N5	R793	J4
L503	D5	Q411	E1	R171	D7	R313	I5	R373	I2	R458	E4	R550	B3	R723	N5	R798	J3
L504	C5	Q501	D1	R172	C6	R314	I5	R374	I2	R459	E5	R551	D1	R724	N6	TP407	E4
L505	E2	Q607	I2	R175	D6	R315	I6	R375	I3	R470	E1	R552	D1	R725	L1	TP409	E4
L560	F2	Q608	I2	R197	D7	R316	I6	R376	I3	R471	E1	R555	D1	R726	L1	TP412	E4
L597	E1	Q615	I2	R198	E7	R317	I6	R377	I3	R475	E1	R564	F3	R727	N2	TP414	E4
L598	F1	R104	E7	R199	D6	R318	I6	R378	H3	R476	E1	R565	F2	R728	N2	TP415	E4
L599	G1	R105	E7	R201	F6	R319	I6	R379	H2	R478	E1	R566	F3	R729	N6	TP416	D4
L601	N6	R106	E6	R202	F7	R320	I6	R401	H3	R479	E1	R567	F3	R730	N6	TP417	D4
L603	O2	R114	C7	R203	F6	R321	I6	R402	H3	R480	E1	R568	A4	R731	J5	TP418	E5
L604	O1	R115	C7	R204	F6	R322	I6	R403	H3	R481	E1	R569	A4	R732	J5	TP419	D5
L605	E3	R118	C7	R206	F6	R323	I6	R404	H3	R501	C4	R570	D3	R733	J5	TP420	D5
L710	J2	R119	C7	R207	F6	R324	I6	R405	G4	R502	C5	R571	D3	R734	J5	TP421	F2
L711	M2	R120	C7	R208	F6	R325	H6	R406	G5	R503	D5	R573	D2	R735	L6	TP422	F3
L722	M2	R121	C7	R209	F6	R326	H5	R407	G3	R504	C5	R575	D3	R736	L6	TP423	F3
L730	J5	R123	C7	R210	F6	R327	H5	R408	G4	R505	B4	R576	D3	R737	M6	TP521	B6
L731	L6	R124	D6	R211	F6	R328	H5	R409	G3	R506	B3	R577	D3	R738	M6	TP544	C5
L742	M5	R125	D6	R212	F6	R329	H5	R410	G4	R507	D3	R578	A5	R739	O5	TP545	C5
L750	J4	R126	K7	R213	G6	R330	H5	R411	G2	R508	D4	R579	A4	R740	N5	TP546	C5
L751	M4	R127	K7	R214	H6	R331	H5	R412	F3	R509	D4	R580	A4	R741	O4	TP547	C5
L762	M5	R129	K7	R215	H6	R332	H5	R413	G3	R510	D4	R581	A4	R742	N3	TP548	C5
L770	J3	R131	C6	R216	G6	R333	H5	R414	G3	R511	C4	R583	B3	R743	N3	TP550	C5
L771	L4	R132	C6	R217	G6	R334	H4	R415	G3	R512	D4	R587	E3	R744	N3	TP551	C5
L781	M3	R135	N7	R218	G6	R335	H4	R416	G3	R513	D4	R589	E2	R745	L5	TP552	C5
OW701	O3	R136	M7	R219	G6	R336	H5	R417	G3	R514	D4	R591	D3	R746	L5	TP553	A4
OW702	O3	R137	K7	R220	G6	R337	H4	R418	G3	R515	A3	R592	D3	R747	N5	TP554	D3
OW703	O3	R138	K7	R221	G6	R338	H4	R419	F3	R516	A3	R596	D4	R748	N6	TP555	D3
OW704	O4	R139	K7	R222	G6	R339	H4	R420	G4	R517	A3	R597	D4	R749	N2	TP:ALE	B4
OW705	O5	R140	K7	R223	H6	R340	I5	R421	G5	R518	A3	R598	D4	R750	N2	TP:MA11	B3
OW706	O5	R141	K7	R224	H6	R341	I4	R422	G4	R520	D3	R599	D4	R751	J4	TP:RFRPC	D4
OW707	O4	R142	K7	R225	H6	R351	H4	R431	G2	R521	B3	R5A1	E2	R752	J4	TP:URD#	A4
OW708	N4	R143	K7	R226	H7	R352	H4	R432	G2	R522	A4	R5A2	D2	R753	J4	TP:UWR#	A4
OW801	O4	R144	K7	R227	H6	R353	I4	R433	G2	R523	A4	R5A7	A5	R754	J4	TU101	M7
OW802	O4	R145	C6	R228	H7	R354	I4	R434	G2	R524	A4	R5A9	A5	R765	L4	X101	C7
OW803	N4	R146	D7	R229	H7	R355	I3	R435	G3	R525	C1	R607	I2	R766	L4	X201	H6
PDM01	H4	R147	D6	R230	H7	R356	H3	R436	G3	R526	D1	R608	I2	R767	N5	X501	D4
PDM03	H2	R148	D7	R231	G6	R357	I3	R437	F2	R527	D1	R609	I2	R768	N5	ZD101	K7
PDV01	I1	R149	D6	R232	G6	R358	I3	R438	F2	R528	D1	R610	O6	R771	J3	ZD635	O1
PDV02	I1	R150	D6	R250	I7	R359	H3	R439	F2	R534	A4	R651	I1	R772	J3	ZD636	O1
PDV03	D1	R151	D6	R251	I6	R360	H3	R440	F3	R535	A4	R652	I1	R773	J3	ZD637	O2
PN102	E7	R152	D6	R301	J2	R361	I3	R441	F3	R537	D2	R711	J2	R775	N3	ZD638	O1
PN401	H2	R153	D6	R302	J2	R362	I3	R442	F3	R539	E4	R712	J2	R776	N3	ZD639	O6
PWS01	O1	R154	D6	R303	J3	R363	H3	R443	F3	R540	D2	R713	J2	R777	M3	ZD640	O7
Q401	E1	R155	D6	R304	J3	R364	H3	R444	F3	R541	E2	R714	J2	R778	M4		



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TP401	K5
TP402	J5
TP403	J5
TP404	J5
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TP503	P5
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TP520	P5
TP522	O6
TP523	P5
TP524	P6
TP525	O4
TP526	P6
TP527	P4
TP528	P6
TP530	P6
TP531	N4
TP532	N4
TP533	P6
TP535	P6
TP537	P6
TP539	O6
TP540	O6
TP541	O6
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MEMO

MEMO

SECTION 4 MECHANISM OF VCR PART(D-37)

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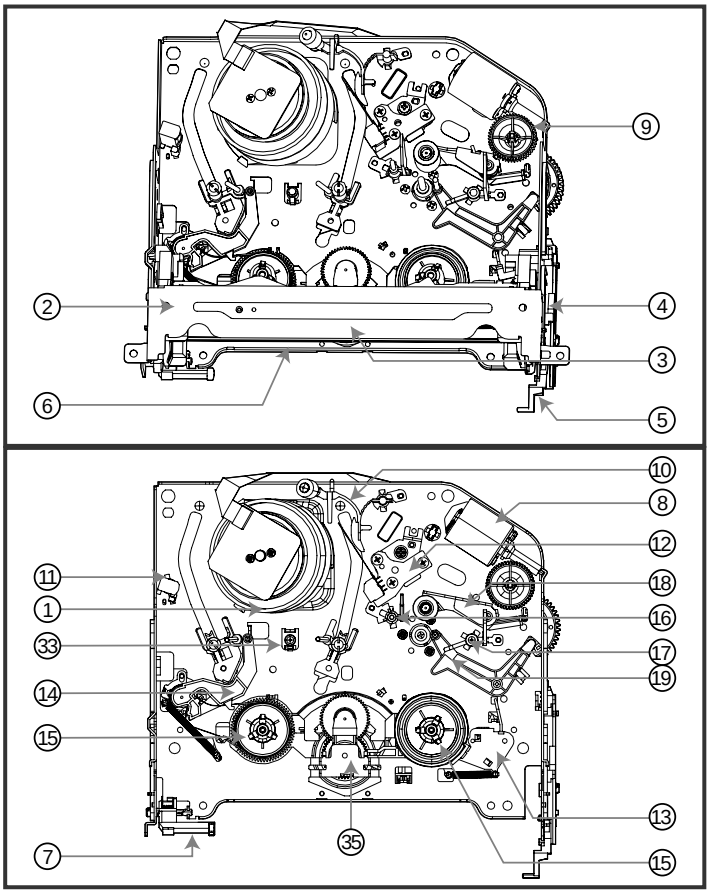
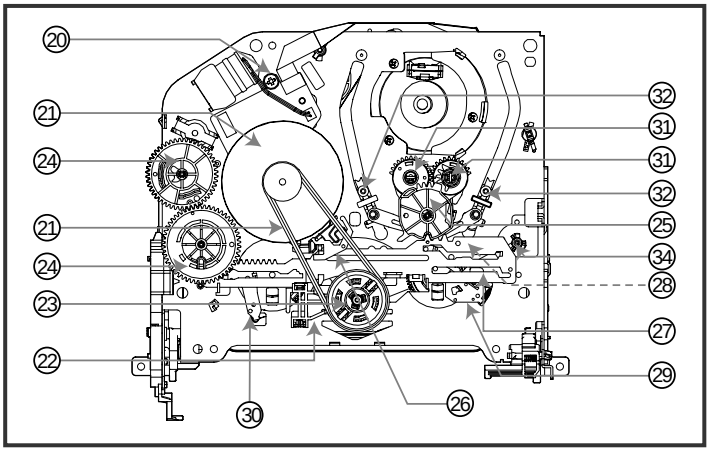
POSITION DRAWING OF DECK MECHANISM PARTS

• Top View



• Bottom View



Order Of Dis-assembled / Parts firstly Disassembled		Part	Fixing Type	Ref. Drawings	Position
	1	Drum Assembly	3 screws	A-1	T
	2	Plate Top	2 hooks	A-2	T
2	3	Holder Assembly CST	6 chasses	A-2	T
2,3	4	Gear Assembly Rack F/L	1 hook	A-2	T
2,3,4	5	Opener Door	Chassis Hole	A-2	T
2,3,4,5	6	Arm Assembly F/L	Chassis Hole	A-2	T
	7	Lever Assembly S/W	Chassis Hole, 1 hook	A-2	T
	8	Motor Assembly L/D	1 screw	A-3	T
	9	Gear Wheel	2 hooks	A-3	T
	10	Arm Assembly Cleaner	Chassis Embossing	A-3	T
	11	Head F/E	Chassis Embossing	A-3	T
	12	Base Assembly A/C Head	1 screw	A-3	T
2,3	13	Brake Assembly T	1 hook	A-4	T
2,3	14	Arm Assembly Tension	1 hook	A-4	T
2,3,13,14	15	Reel S / Reel T	Shaft	A-4	T
	16	Base Assembly P4	Chassis Embossing	A-5	T
	17	Opener Lid	Chassis Embossing	A-5	T
17	18	Arm Assembly Pinch	Shaft	A-5	T
17	19	Arm T/up	1 hook	A-5	T
	20	Supporter, capstan	Chassis Hole	A-6	B
17,18	21	Belt Capstan/Motor Capstan	3 screws	A-6	B
	22	Lever F/R	Locking Tab	A-6	B
21, 22	23	Clutch Assembly D37	Washer	A-6	B
	24	Gear Drive/Gear Cam	Washer/Hook	A-7	B
	25	Gear Sector	Hook	A-7	B
21	26	Brake Assembly Capstan	Chassis Hole	A-7	B
21,22,23, 24,2526	27	Plate Slider	Chassis Guide	A-7	B
21,22,23, 24,2526,27	28	Lever Tension	1 Hook	A7	B
21,22,23, 24,2526,27	29	Lever Spring	1 Hook	A-7	B
21,22,23, 24,2526,27	30	Lever Brake	1 Hook	A-7	B
25	31	Gear Assembly P2/ Gear Assembly P3	Bass	A-8	B
2, 3, 14, 25, 31	32	Base Assembly P2 /Base Assembly P3	6 Chasses	A-8	B
25, 31	33	Base Loading	3 Hooks	A-8	B
2,3,14	34	Base Tension	Chassis Embossing	A-9	T
	35	Arm Assembly Idler Jog	Locking Tab	A-9	T

T:Top, B:Bottom

NOTE : Assembly order is a reverse of disassembly order.

(1) For assembly, check the assembly mode is accurate.
(2) Parts firstly disassembled indicate parts firstly disassembled in disassembly of related parts.

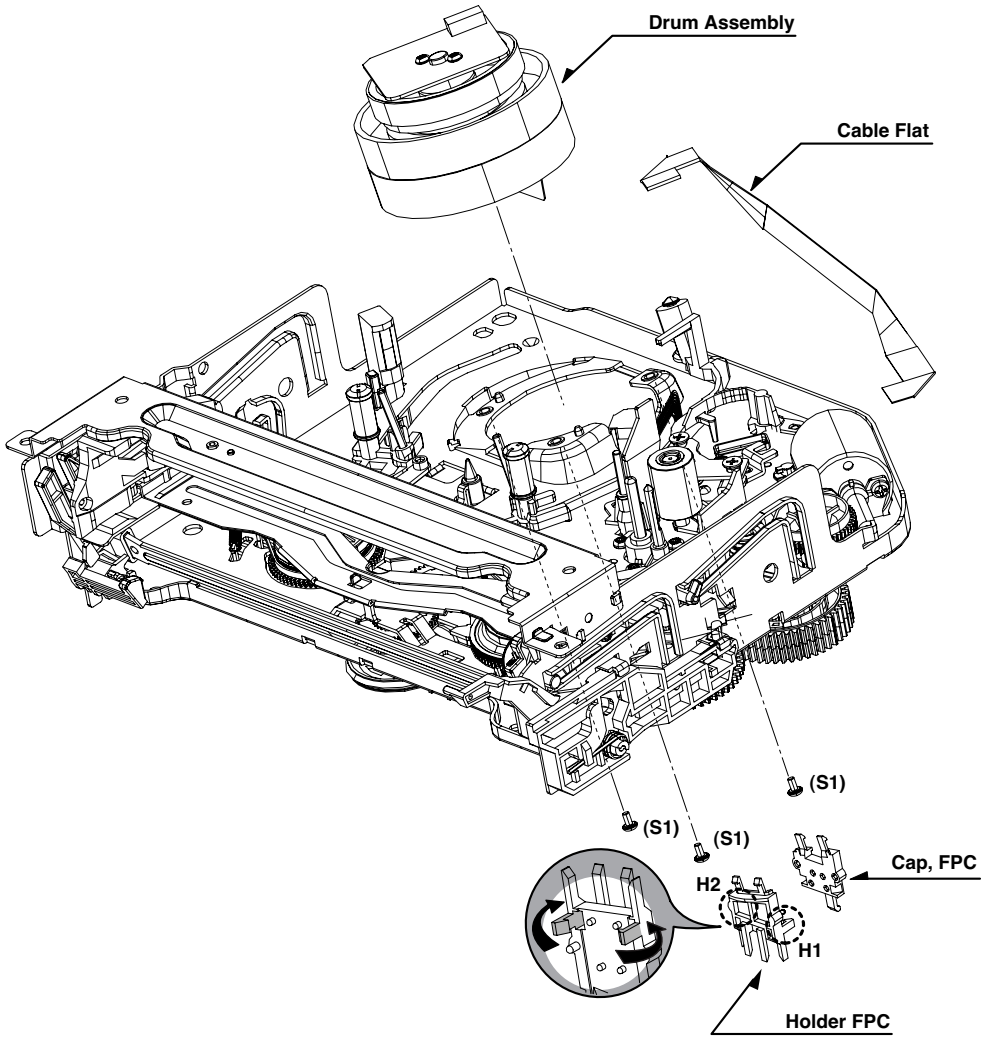
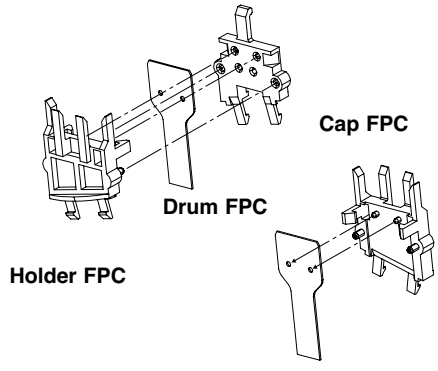


Fig. A-1

1. Disassembly of Drum Assembly (Figure A-1)

1) Separate cable flat from the Drum FPC and the Capstan Motor.
2) Release 3 screws (S1) on the bottom side of the chassis, and separate the drum assembly.
3) Release the hooks (H1, H2) and separate both the holder FPC and the Cap FPC (disassemble if necessary).

Cautions in assembly of FPC



Assembly shape seen in the reverse direction

DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

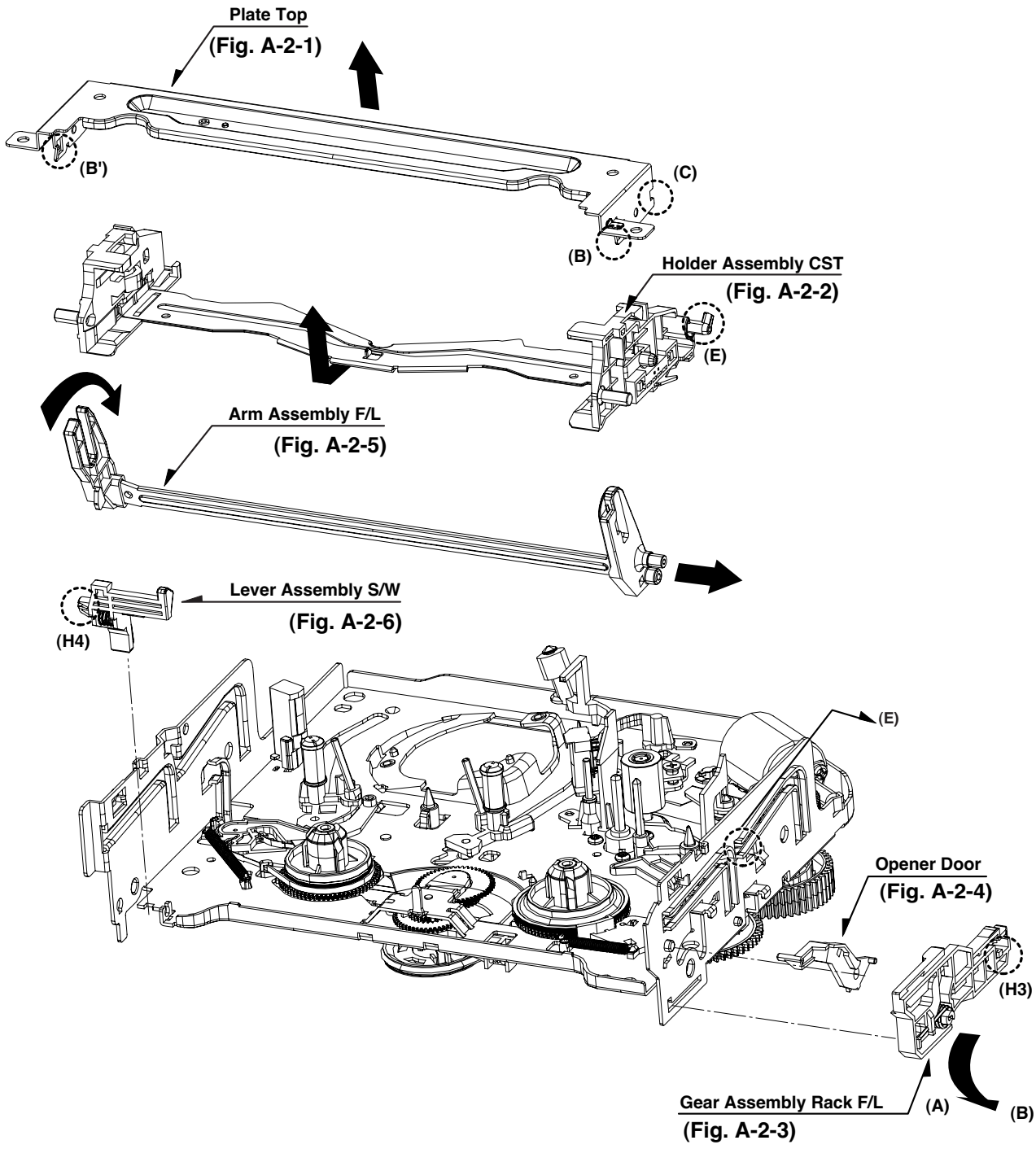


Fig. A-2

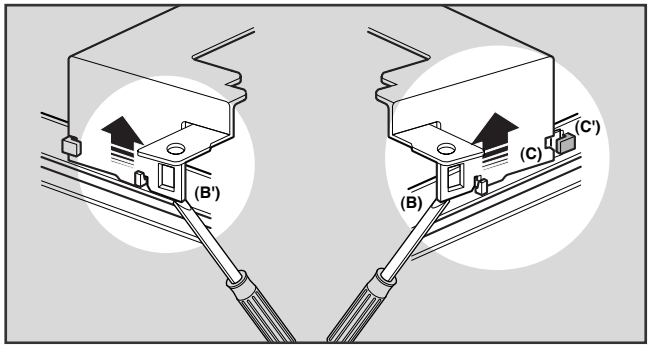
DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

2. Disassembly of Plate Top (Fig. A-2-1)

1) Separate the right part while leaning back the (B) part of the plate top toward the arrow direction.
2) Separate the left part while leaning back the (B') part of the plate top toward the arrow direction.
(Tool used: Tool such as (-) driver, auger, etc with pointed or flat end)

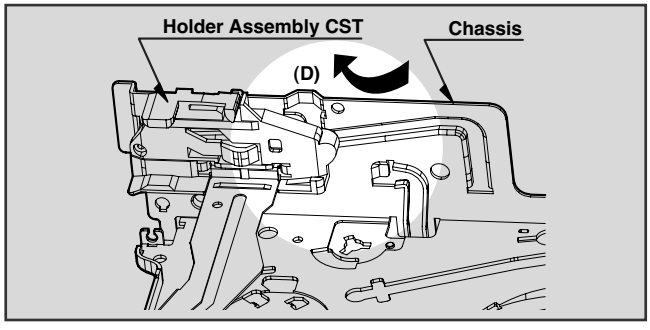
CAUTIONS

Assemble while pressing the (C), (C') part after corresponding them as in drawing.



3. Holder Assembly CST (Fig. A-2-2)

1) Firstly separate the left part from the groove on the (D) part of chassis while moving the holder assembly CST toward the arrow direction.



2) Separate the right part from each groove of chassis

CAUTIONS

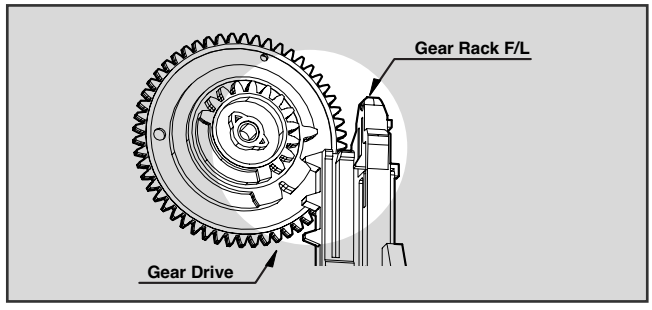
Assemble by inserting the left part after firstly inserting the (E) part of the holder assembly CST into the groove on the (E') part of chassis.

4. Disassembly of Gear Assembly Rack F/L (Fig. A-2-3)

1) Separate the hook (H3) while leaning ahead the hook (3) after moving the gear assembly rack F/L toward the arrow (A) direction.
2) Separate the gear assembly rack F/L toward the arrow (B) direction.

CAUTIONS

For the assembly, correspond the gear part of gear assembly rack F/L to the gear drive.



5. Opener Door (Fig. A-2-4)

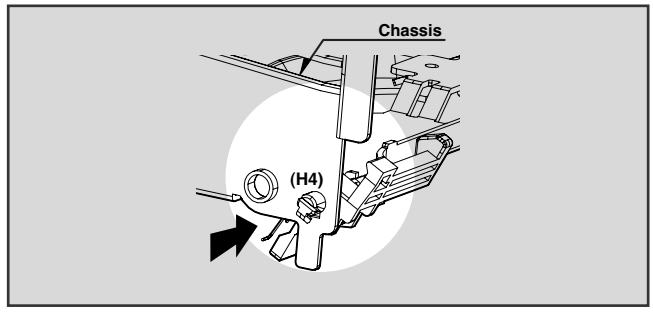
1) Separate the opener door ahead from the guide hole of chassis while turning it clockwise.

6. Arm Assembly F/L (Fig. A-2-5)

1) Firstly separate the left part of the arm assembly F/L from the groove of chassis while pushing the arm assembly F/L toward the arrow direction.
2) Separate the right part from the groove of chassis.).

7. Lever Assembly S/W (Fig. A-2-6)

1) Separate the lever assembly S/W while pushing it toward the arrow direction after removing the hook (4) on the left side of chassis.



DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

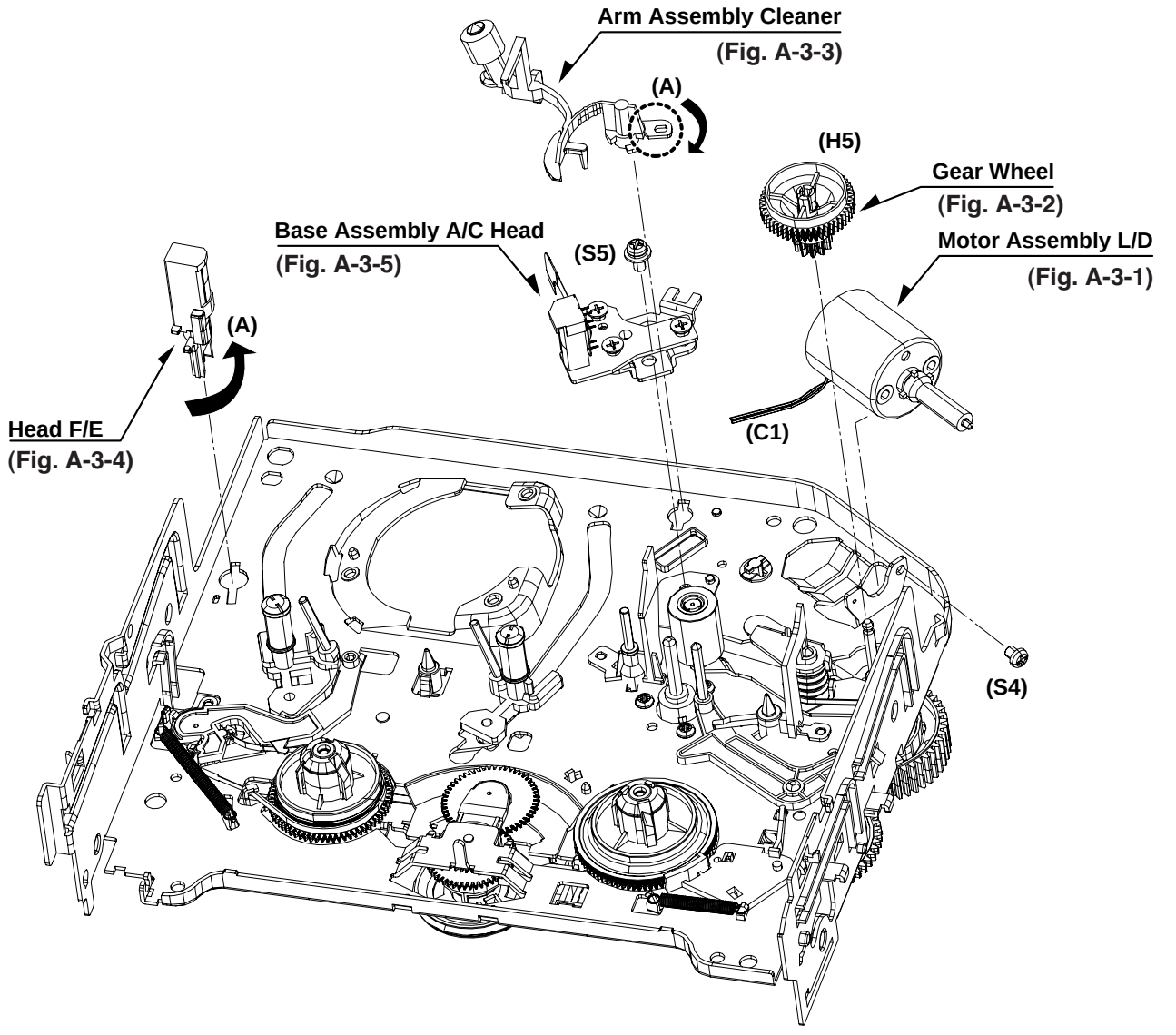


Fig. A-3

8. Motor Assembly L/D (Fig. A-3-1)

1) Take the connector (C1) connected to the Capstan motor PCB out.
2) Remove a screw (S4) of the chassis (S4) and step backward, and disassemble it while holding it up.

9. Gear Wheel (Fig. A-3-2)

1) Release the hook (H5) of the gear wheel and disassemble it upward.

10. Arm Assembly Cleaner (Fig. A-3-3)

1) Separate the (A) part of Fig. A-3-1 from the embossing of chassis, and hold it up while turning it anti-clockwise.

11. Head F/E (Fig. A-3-4)

1) Separate the (A) part of the head F/E from the embossing of chassis, and hold it up while turning it anti-clockwise.

12. Base Assembly A/C Head (Fig. A-3-5)

1) Release a screw (S5) and disassemble while holding it up.

DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

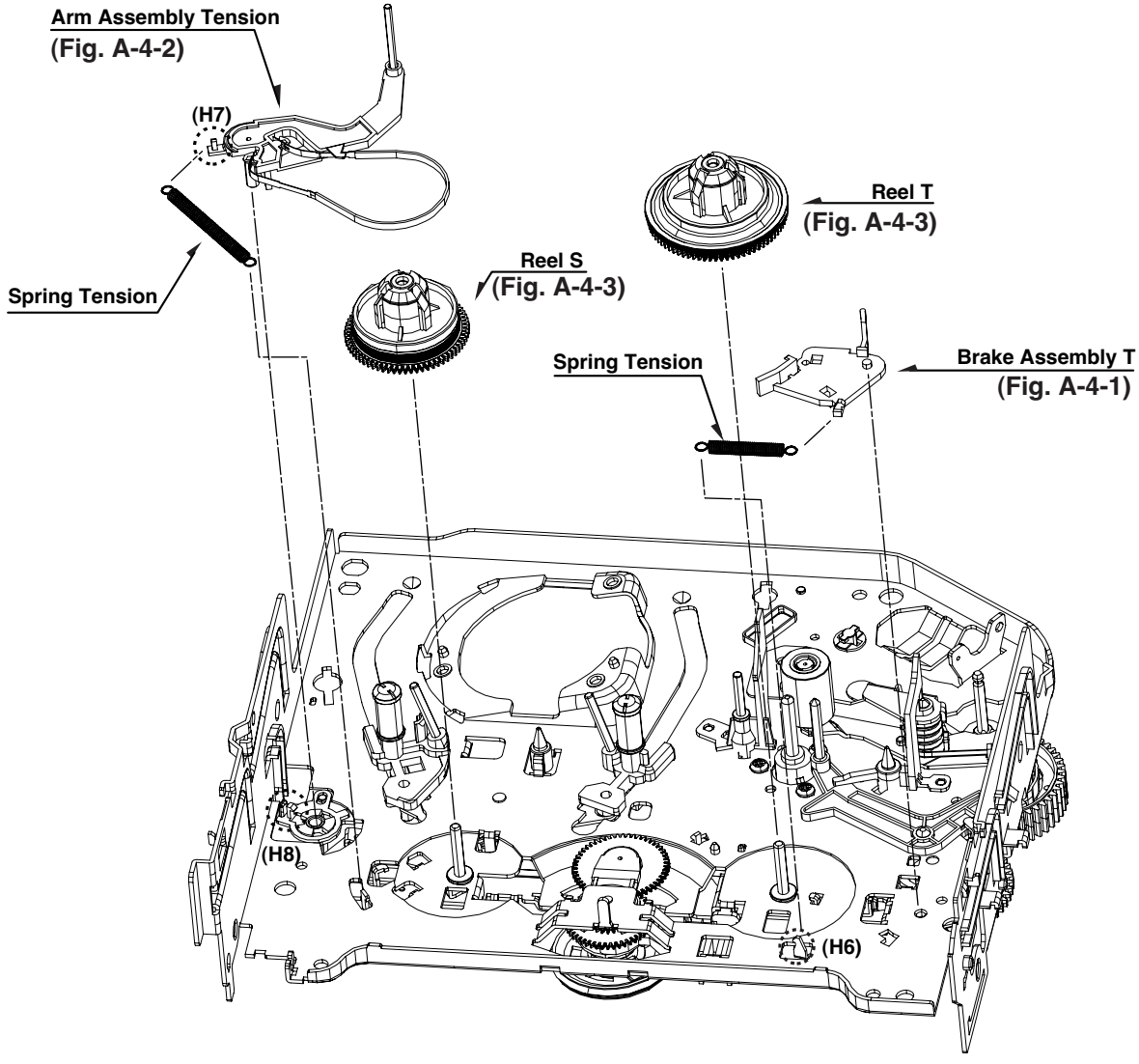


Fig. A-4

13. Brake Assembly T (Fig. A-4-1)

1) Release the spring tension from the lever spring hook (H6).
2) Disassemble the brake assembly T while holding it upward.

14. Arm Assembly Tension (Fig. A-4-2)

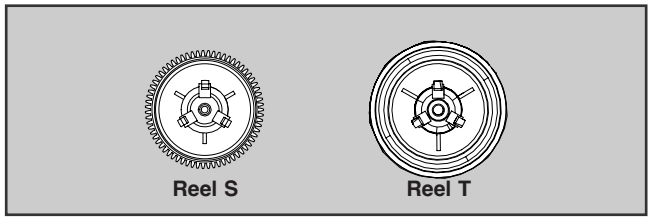
1) Release the spring tension the hook (H7) from the arm assembly tension.
2) After releasing the hook (H8) of the base tension, separate it while holding it up.

CAUTIONS

Spring used for both brake assembly T and arm assembly tension is used (2EA used).

15. Reel S/Reel T (Fig. A-4-3)

1) Disassemble the reel S/ reel T while holding it up (comparison between Reel S and Reel T)



DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

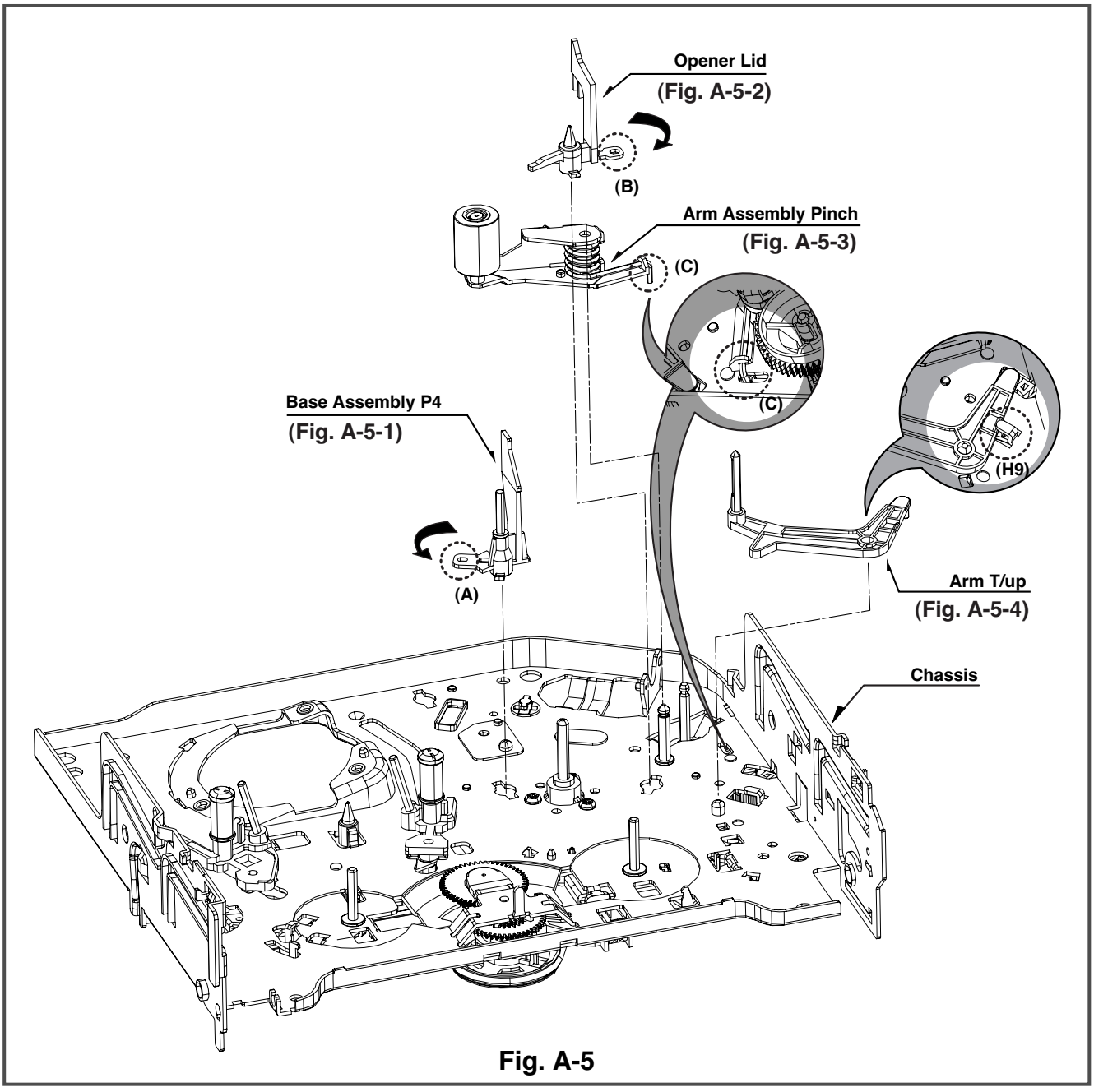


Fig. A-5

16. Base Assembly P4 (Fig. A-5-1)

1) Release the (A) part of the base assembly P4 from the embossing of chassis.
2) Hold the base assembly P4 up while turning it anti-clockwise.

17. Opener Lid (Fig. A-5-2)

1) Release the (B) part of the opener lid from the embossing of chassis.
2) Disassemble the opener lid upward while turning it anti-clockwise.

18. Arm Assembly Pinch (Fig. A-5-3)

1) Hold the arm assembly pinch up.

19. Arm T/up (Fig. A-5-4)

1) Turn the arm T/up to release the anchor jaw (H9) part of chassis and then hold it upward.

CAUTIONS

For the assembly, check the (C) part of the arm assembly pinch is assembled as in drawing.

- REVERSE THE MECHANISM.

DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

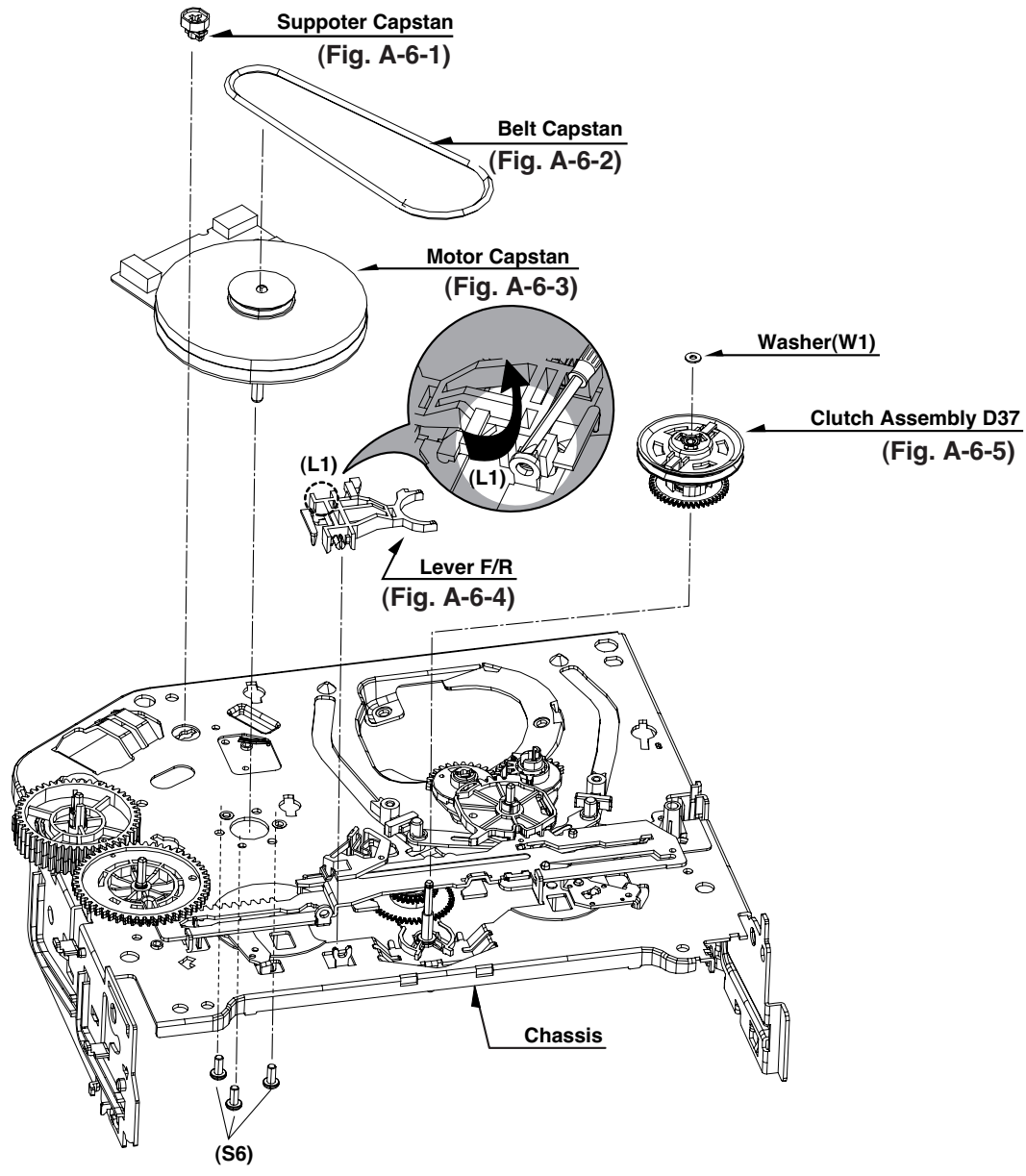


Fig. A-6

20. Supporter, Capstan (Fig. A-6-1)

1) Turn the supporter and Capstan by 90 deg. clockwise with a driver for disassembly.

21. Belt Capstan (Fig. A-6-2) / Motor Capstan (Fig. A-6-3)

1) Separate the belt Capstan.
2) Undo 3 screws (S6) on the bottom side of chassis and disassemble it upward.

22. Lever F/R (Fig. A-6-4)

1) Release the locking tab (L1) and then disassemble it upward.

23. Clutch Assembly D37 (Fig. A-6-5)

1) Remove the washer (W1) and then disassemble it upward.

DISASSEMBLY AND ASSEMBLY OF DECK MECHANISM

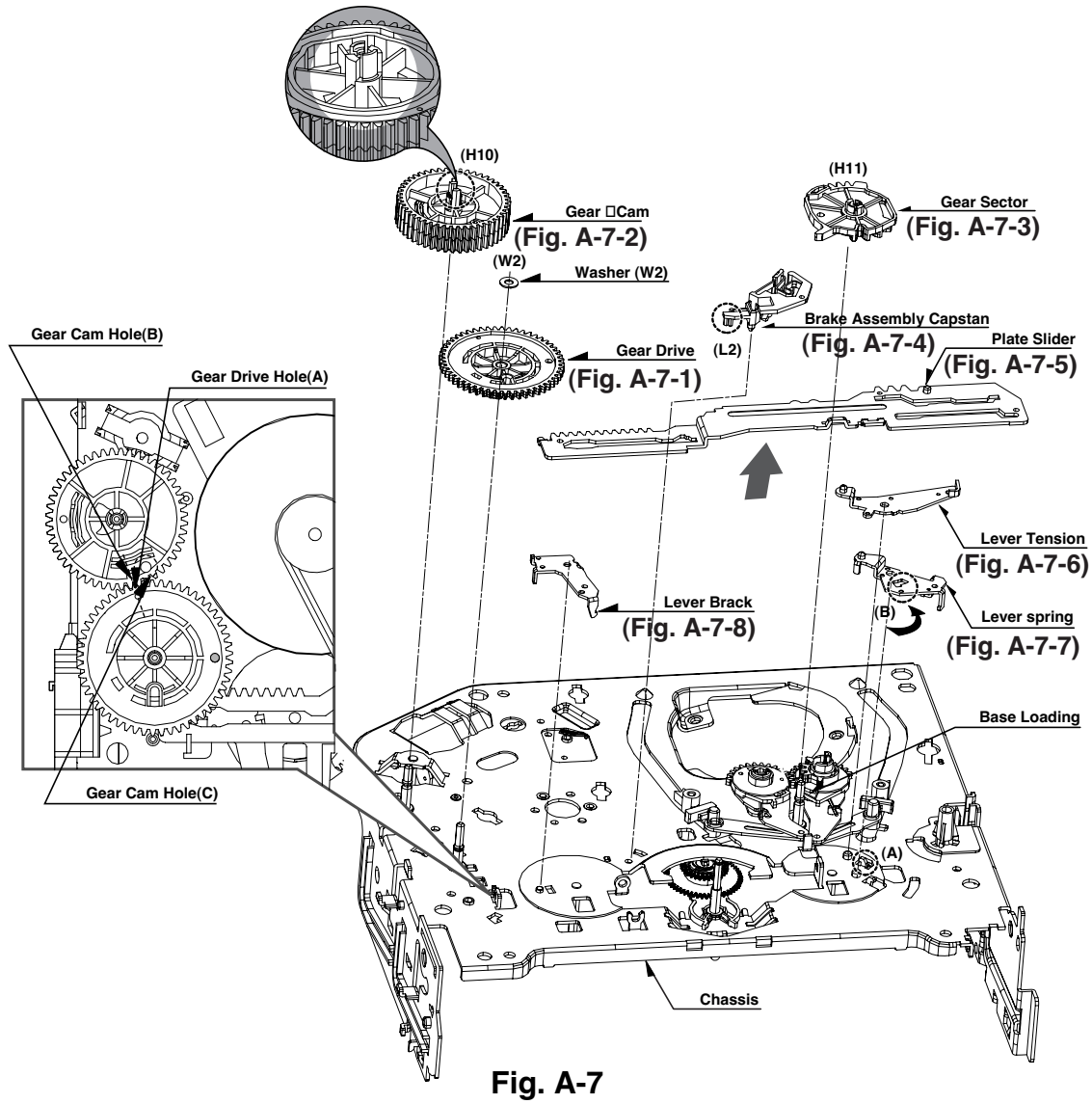


Fig. A-7

24. Gear Drive (Fig. A-7-1)/ Gear Cam (Fig. A-7-2)

1) Remove the washer (W2) and then disassemble the gear drive.
2) Release the hook (H10) of the gear cam and then disassemble it upward.

CAUTIONS

For the assembly, adjust both the gear driver hole (A) and the gear cam hole (B) straightly and then correspond the gear cam hole (C) to the chassis hole.

25. Gear Sector (Fig. A-7-3)

1) Release the hook (H11) of the gear sector and then hold the gear sector upward.

26. Brake Assembly Capstan (Fig. A-7-4)

1) Release the locking tab (L2) on the bottom side of the plate slider and then disassemble it upward.

27. Plate Slider (Fig. A-7-5)

1) Disassemble the plate slider while holding it up.

28. Lever Tension (Fig. A-7-6)

1) Release the lever tension from the guide (A) of chassis while turning it anti-clockwise.
2) Disassemble the lever tension while holding it up.

29. Lever Spring (Fig. A-7-7)

1) Release the (B) part of the lever spring from the guide (A) of chassis while turning it anti-clockwise.
2) Disassemble the lever tension while holding it up.

30. Lever Brake (Fig. A-7-8)

1) Disassemble the lever brake while holding it up.

DECK MECHANISM DISASSEMBLY

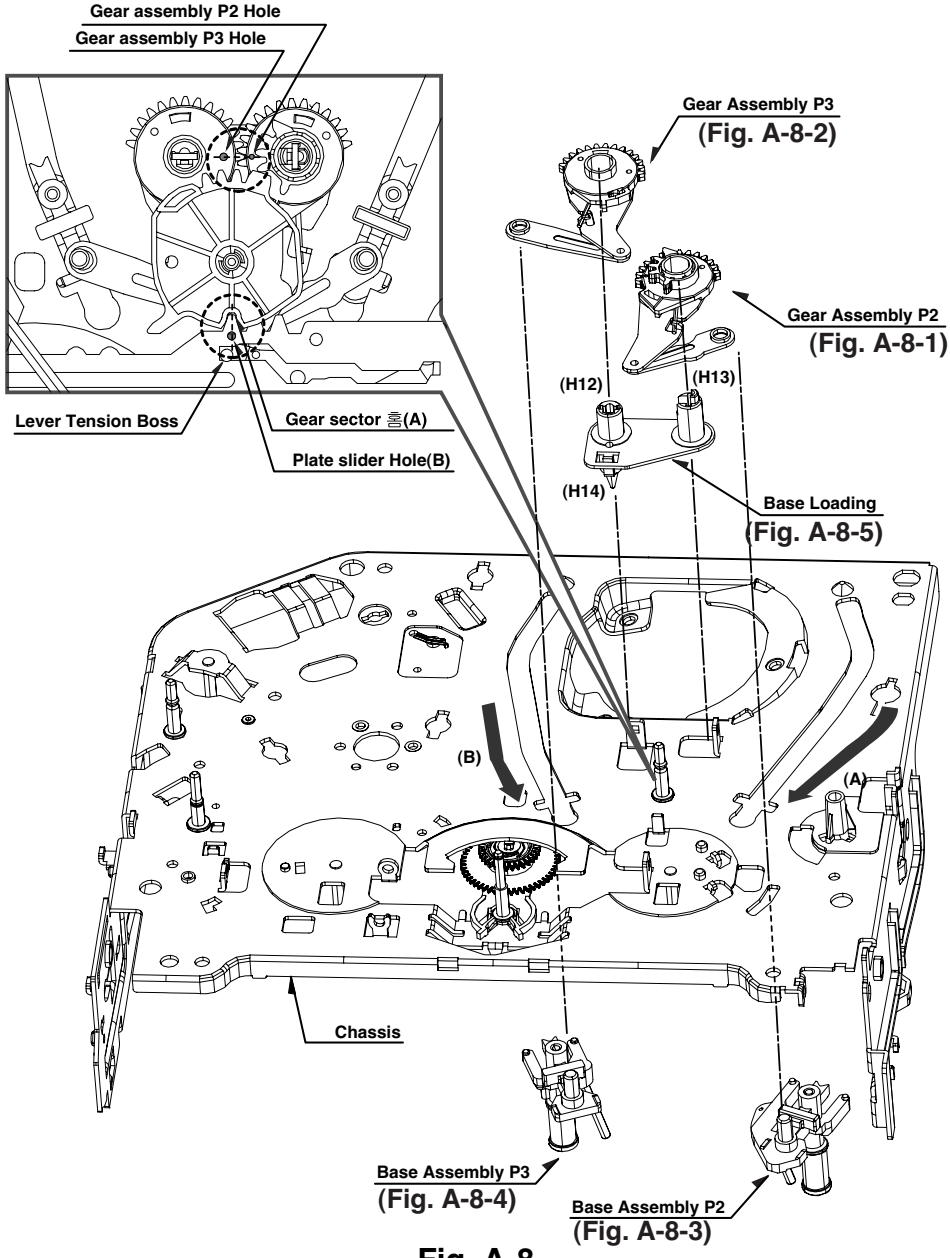


Fig. A-8

31. Gear Assembly P2 (Fig. A-8-1)/ Gear Assembly P3 (Fig. A-8-2)

1) Hold the gear assembly P2 upward.
2) Hold the gear assembly P3 upward.

CAUTIONS

For the assembly, check the holes of both the gear assembly P2 and the P3 are adjusted straightly, and then correspond the gear section groove (A) to the plate slider hole (B).

32. Base Assembly P2 (Fig. A-8-3)/ Base Assembly P3 (Fig. A-8-4)

1) Disassemble the base assembly P2 downward while moving it toward the arrow (A) direction along with the guide hole of chassis.
2) Disassemble the base assembly P2 downward while moving it toward the arrow (B) direction along with the guide hole of chassis.

33. Base Loading (Fig. A-8-5)

1) Release 3 hooks (H12, 13, 14) of the base loading, and then disassemble them upward.
   - Reverse the mechanism.

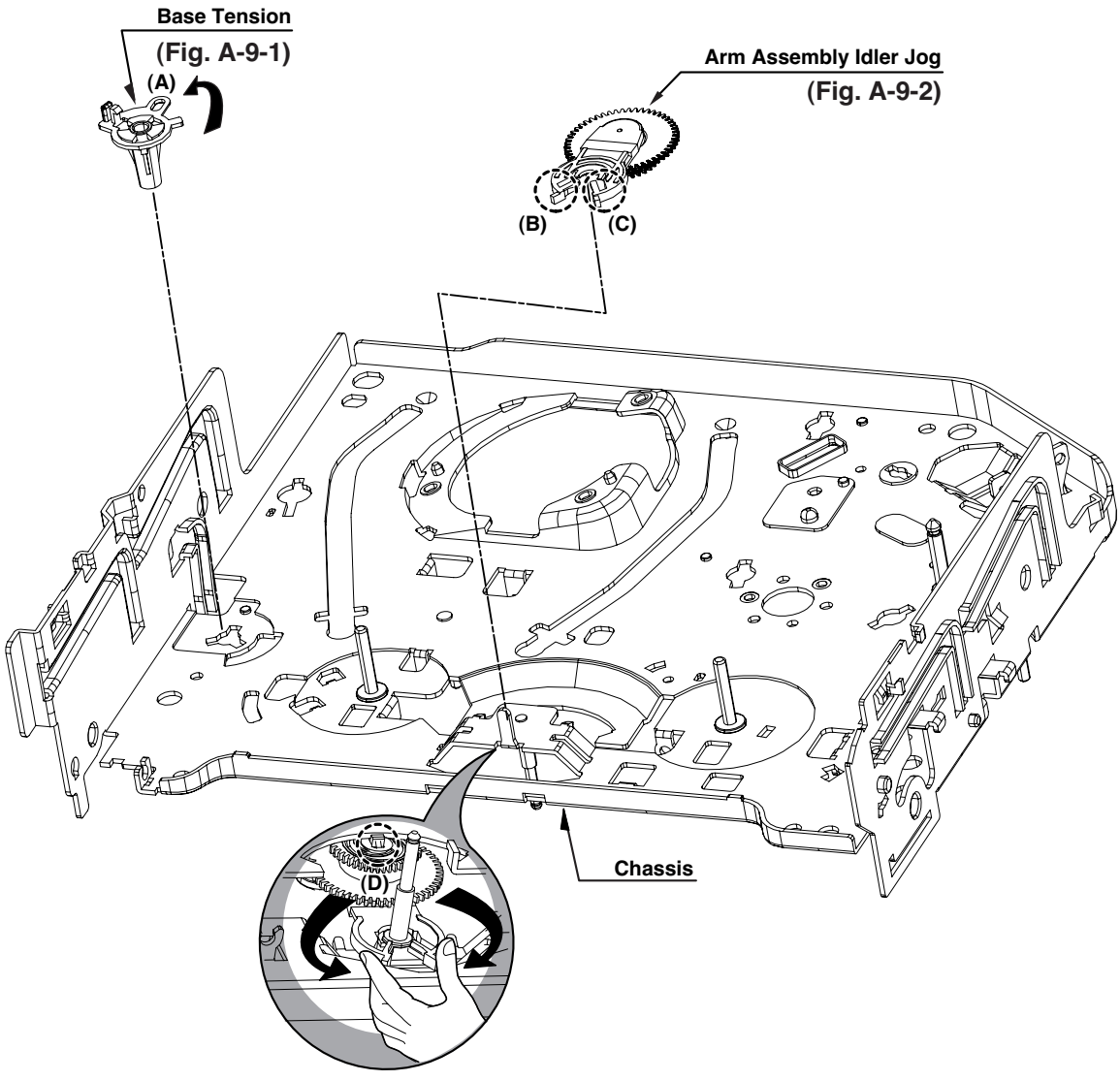


Fig. A-9

34. Base Tension (Fig. A-9-1)

1) Release the (A) part of the base tension from the embossing of chassis.
2) Hold the base tension upward while turning it anti-clockwise.

35. Arm assembly Idler Jog (Fig. A-9-2)

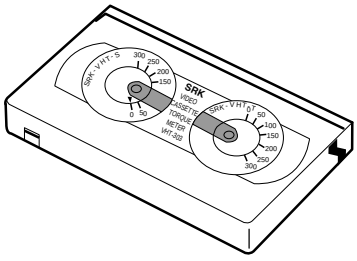
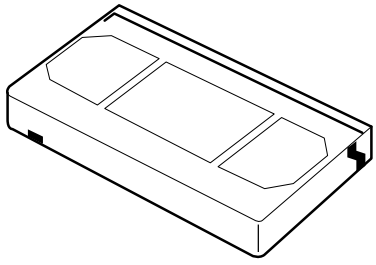
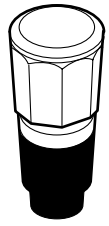
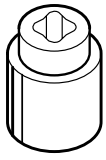
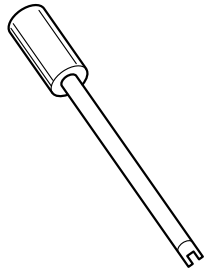
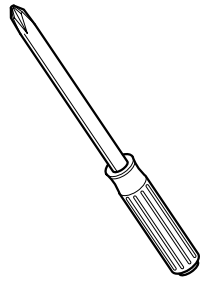
1) Push both (B), (C) parts in Fig. A-9-2 toward the arrow direction.
2) Disassemble the arm assembly idler upward.

CAUTIONS

Take care to ensure that the (D) part in the drawing is not hung to chassis in disassembly.

DECK MECHANISM ADJUSTMENT

• Fixtures and Tools for Service

1. Cassette Torque Meter **SRK-VHT-303(Not SVC part)** **Part No:D00-D006** 	**2. Alignment tape** **Part No NTSC:DTN-0001** **PAL:DTN-0002** 	**3. Torque gauge** **600g.Cm ATG** **Part No:D00-D002** 
4. Torque gauge adaptor **Part No:D09-R001** 	**5. Post height adjusting driver** **Part No:DTL-0005** 	**6. + Type driver (ø5)** 

DECK MECHANISM ADJUSTMENT

1. Mechanism Assembly Mode Check

Purpose of adjustment : To make tools normally operate by positioning tools accurately.		
Fixtures and tools used	**VCR (VCP) status**	**Checking Position**
• Blank Tape (empty tape)	• Eject Mode (with cassette withdrawn)	• Mechanism and Mode Switch

1) Turn the VCR on and take the tape out by pressing the eject button.
2) Separate both top cover and plate top, and check both the hole (A) of gear cam and the hole (A') of chassis correspond (Fig. C-2).
3) If it is done as in the paragraph 2): Turn the gear cam as in No.2) after mantling the motor assembly L/D.
4) Undo the screw fixing the deck and the main frame, and separate the deck assembly. Check both the hole (A) of gear cam and the hole (A') of chassis correspond (Fig. C-1).
5) Check the mode S/W on the main P.C. board locates at a proper position as in (B) of the Fig. (C-1).
6) Connect the deck to the main P.C. board and perform all types of test.

CHECK DIAGRAM

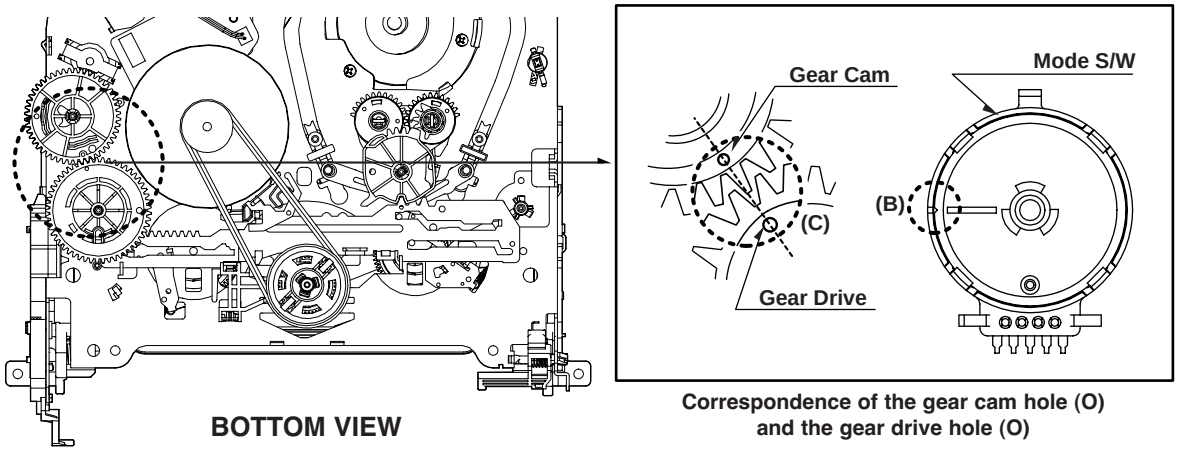


Fig. C-1

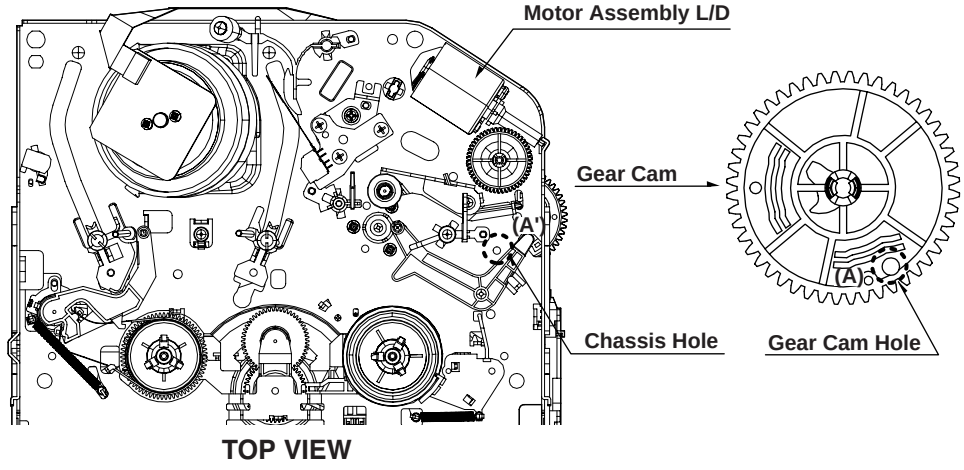


Fig. C-2

2. Previous Preparation for Deck Adjustment

(Preparation to load the VCR (VCP) with cassette tape not inserted)

1) Take the power cord from the consent.
2) Separate the top cover and the plate assembly top.
3) Insert the power cord into again.
4) Turn the VCR (VCP) on and load the cassette while pushing the lever stopper of the holder assembly CST backward. In this case, clog both holes on the housing rail part of chassis to prevent detection of the end sensor.

If doing so, proceeding to the stop mode is done. In this status, input signals of all modes can be received. However, operation of the Rewind and the Review is impossible since the take-up reel remains at stop status and so cannot detect the reel pulse (however, possible for several seconds).

3. Torque Measuring

Purpose of Measuring : To measure and check the reel torque on the take-up part and the supply part that performs basic operation of the VCR (VCP) for smoothly forwarding the tape.
Measure and check followings when the tape is not smoothly wound or the tape velocity is abnormally proceeded:

Fixtures and tools used	VCR (VCP) status	Measuring method
• Torque Gauge (600 g.cm ATG) • Torque Gauge Adaptor • Cassette Torque Meter SRK-VHT-303	• Play (FF) or Review (REW) Mode	• Try to operate the VCR (VCP) per mode with the tape not inserted (See '2. Prior Preparation for Deck Adjustment). • Measure after adhering and fixing the torque gauge adaptor to the torque gauge (Fig. C-3-1) • Read scale of the supply or take-up part of the cassette torque meter (Fig. C-3-2).

Item	Mode	Instruments	Reel Measured	Measuring Value
Fast forward Torque	Fast Forward	Torque Gauge	Take-Up Reel	More than 400g°cm
Rewind Torque	Rewind	Torque Gauge	Supply Reel	More than 400g°cm
Play Take-Up Torque	Play	VHT-303	Take-Up Reel	40~100g°cm
Review Torque	Review	VHT-303	Supply Reel	120~210g°cm

NOTE

Adhere the torque gauge adaptor to the torque gauge for measuring the value.

• Torque Gauge (600g.cm ATG)

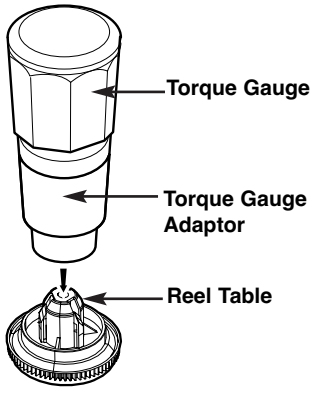


Fig. C-3-1

• Cassette Torque Meter (SRK-VHT-303)

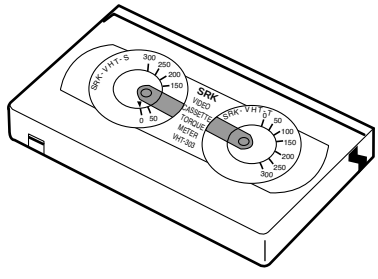


Fig. C-3-2

DECK MECHANISM ADJUSTMENT

4. Guide Roller Height Adjustment

Purpose of adjustment : To ensure that the bottom surface of the tape can travel along with the tape lead line of the lower drum by constantly and adjusting and maintaining the height of the tape.

4-1. Prior Adjustment

Fixtures and tools used	VCR (VCP) status	Adjustment position
• Post Height Adjusting Driver	• Play or Review Mode	• The guide roller height adjusting screw on the supply guide roller and the take-up guide roller

Adjustment Procedure

1) Travel the tape and check the bottom surface of the tape travels along with the guide line of the lower drum.
2) If the tape travels toward the lower part of guide line on the lower drum, turn the guide roller height adjusting screw to the left
3) If it travels to the upper part, turn it to the right.
4) Adjust the height of the guide roller to ensure that the tape is guided on the guide line of the lower drum at the inlet/outlet of the drum. (Fig. C-4-1)

ADJUSTMENT DIAGRAM

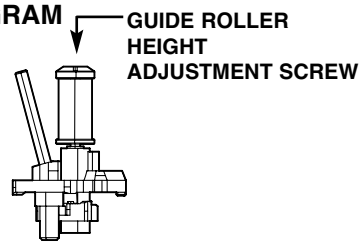


Fig. C-4-1

4-2. Fine Adjustment

Fixtures and tools used	Measuring tools and connection position	VCR (VCP) status	Adjustment position
• Oscilloscope • Standard test tape • Post height adjusting driver	• CH-1: PB RF Envelope • CH-2: NTSC : SW 30Hz PAL : SW 25Hz • Head switching output point • RF Envelope output point	• Play the standard test tape.	• Guide roller height adjusting screw

1) Play the standard test tape after connecting the probe of oscilloscope to the RF envelope output point and the head switching output point.
2) Tracking control (playback) : Locate it at the center (Set the RF output to the maximum value via the tracking control when such adjustment is completed after the drum assembly is replaced.)
3) Height adjusting screw: Flatten the RF waveform. (Fig. C-4-2)
4) Move the tracking control (playback) to the right/left. (Fig. C-4-3)
5) Check the start and the end of the RF output reduction width are constant.

CAUTIONS

There must exist no crumpling and folding of the tape due to excess adjustment or insufficient adjustment.

Waveform

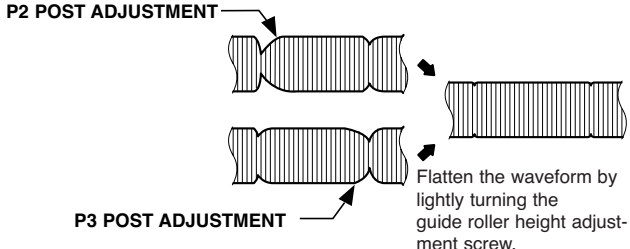

P2 POST ADJUSTMENT
P3 POST ADJUSTMENT
Flatten the waveform by lightly turning the guide roller height adjustment screw.

Fig. C-4-2

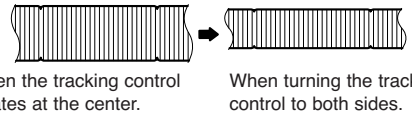
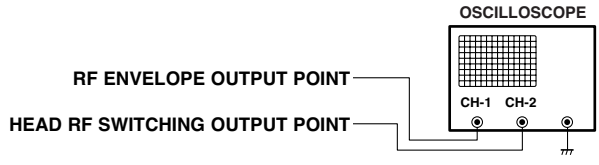


Fig. C-4-2

Connection Diagram



DECK MECHANISM ADJUSTMENT

5. Audio/Control (A/C) Head Adjustment

Purpose of adjustment : To ensure that audio and control signals can be recorded and played according to the contract tract by constantly maintaining distance between tape and head, and tape tension between the P3 post and the P4 post.

5-1. Prior Adjustment (performed only when no audio output appears in play of the standard test tape)

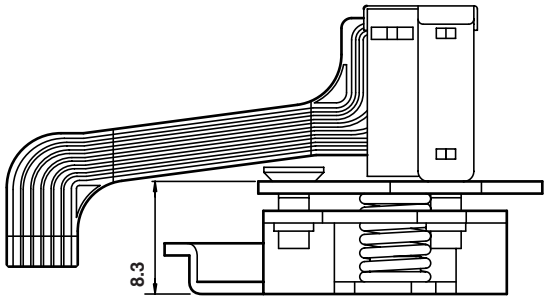
Fixtures and tools used	VCR (VCP) status	Adjustment position
• Blank Tape (Empty Tape) • Driver (+) Type ø 5	• Play the blank tape (empty tape).	• Tilt adjusting screw (C) • Height adjusting screw (B) • Azimuth adjusting screw (A)

Adjustment Procedure/Adjustment Diagrams

1) Basically use the A/C head assembly adjusted as in SPEC.
2) Check there is crumpling and folding of the tape around the A/C head. If it is, Turn and adjust the tilt adjusting screw to ensure that the tape corresponds to the bottom guide of the P4, and recheck the tape path after proceeding play for 4-5 seconds.
3) Where the tape bottom is not equal to Fig. C-5-3, Adjust the height by using the height adjusting screw (B) and then readjust it by using the tilt adjusting screw (C).

CAUTIONS

Always check the height of the A/C head since most ideal height of A/C head can be obtained when the bottom part of the tape is away 0.2 ~ 0.25mm from the bottom part of the A/C head.



A/C Head Base

Fig. C-5-1

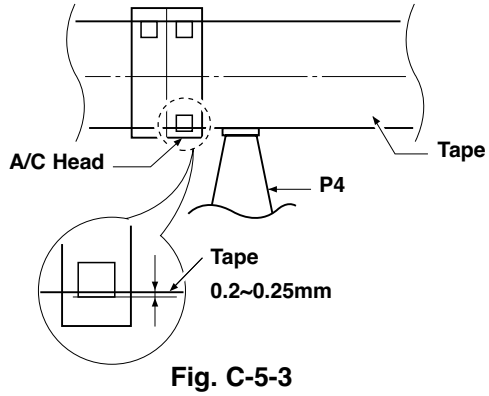
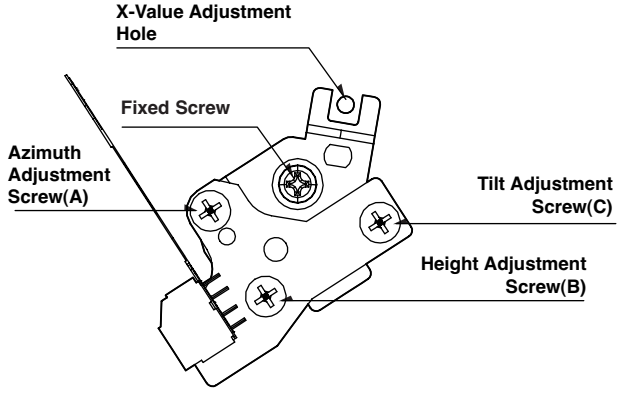


Fig. C-5-3



A/C Head Assembly

Fig. C-5-2

5-2. Tape Path Check between Pinch Roller and Take up Guide (Check in the Rev Mode)

1) Check the tape pass status between the pinch roller and the take-up guide.(Check there is crumpling of the tape pass and folding of the take-up guide.)
   (1) When holding of the take-up guide bottom occurs Turn the tilt adjusting screw (C) clockwise and travel it stably to ensure there is no crumbling or folding of the tape.
   (2) When holding of the take-up guide top occurs Turn the tilt adjusting screw (C) anti-clockwise and travel it stably to ensure there is no crumbling or folding of the tape.

2) Check there is folding of the tape at the bottom or top of the take-up guide in cutting-off the REV mode

CAUTIONS

If the RF waveform is changed after adjusting the A/C head, perform fine adjustment to ensure the RF waveform is flattened.

5-3. Fine Adjustment (Azimuth Adjustment)

Fixtures and tools used	Connection position	VCR (VCP) status	Adjustment position
• Oscilloscope • Standard test tape (only for SP) • Driver (+) Type Ø 4	• Audio Output Jack	• Play the standard test • Tape, 1KHz, 7KHz.	• Azimuth Adjusting Screw (A) • Height Adjusting Screw (B)

Adjustment Procedure

1) Connect the probe of Oscilloscope to the audio output jack.
2) Ensure that Audio 1KHz, 7KHz output is flattened at the maximization point by adjusting the Azimuth adjusting screw (A).

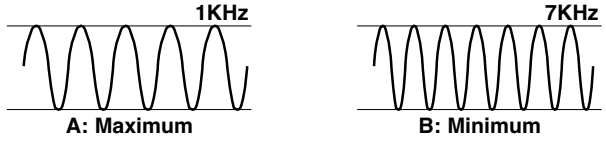
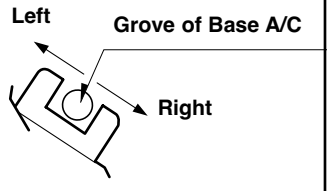


Fig. C-5-4

6. X-distance Adjustment

Purpose of adjustment : To maintain compatibility with other VCR (VCP).

Fixtures and tools used	Connection position	VCR (VCP) status	Adjustment position
• Oscilloscope • Standard test tape (only for SP) • Driver (+) Type Ø 4	• CH-1: PB RF Envelope • CH-2: NTSC ; SW 30Hz PAL:SW 25Hz • Head switching output point • RF Envelope output point	• Play the standard test tape.	

Adjustment Procedure

1) After releasing the auto tracking, lightly turn the fixing screw. Turn the (+) type driver (Ø 3 ~ Ø 4) on the X-distance adjusting hole to the right or left. Adjust the RF envelope level to the maximum point and then fix the fixing screws.
2) For the 31mm head, adjust it with the SP tape recorded in the width of 31mm since the head travels on the tape track only for SP with the width of 58mm.

Connection Diagram

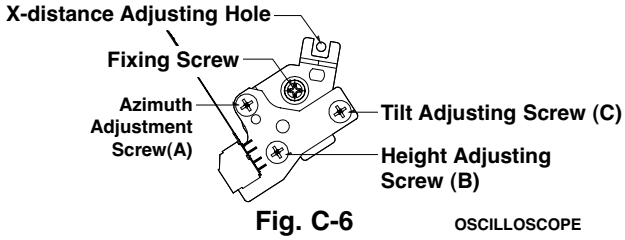
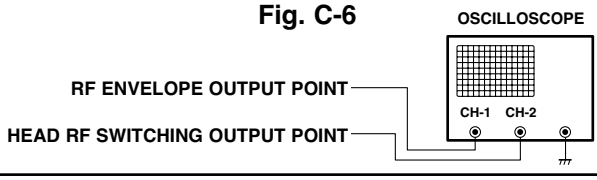


Fig. C-6



DECK MECHANISM ADJUSTMENT

7. Adjustment after Drum Assembly (Video Heads)

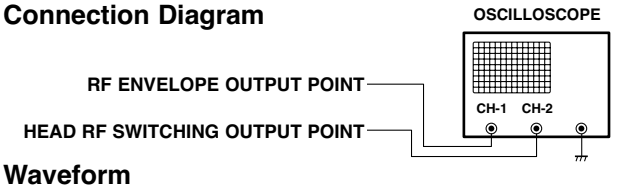
Purpose of adjustment : To adjust and stabilize the height change, X-distance change, etc depending on the guide roller after assembling the drum.

Fixtures and tools used	Connection position	VCR (VCP) status	Adjustment position
• Oscilloscope • Standard test tape (only for SP) • Post Height Adjusting Driver • Driver (+) Type Ø 5	• CH-1: PB RF Envelope • CH-2: NTSC : SW 30Hz PAL:SW 25Hz • Head switching output point • RF Envelope output point	• Play the blank tape. • Play the standard test tape.	• Fine adjustment of guide roller • Switching Point • Tracking Preset • X-distance

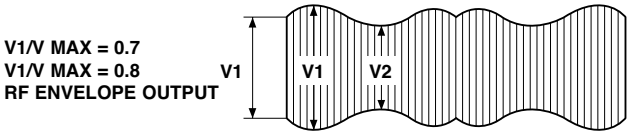
Checking/Adjustment Procedure

1) Play the blank tape (empty tape) and check whether the guide roller crumbles or wrinkles the tape and adjust it if necessary.
2) Check that the RF envelope output waveform is flat, and adjust the height of the guide roller while playing the standard test tape.
3) Adjust the switching point.
4) Check the RF envelope output is the maximum when the tracking control locates at the center. If not maximum, set up to ensure that RF envelope output becomes the maximum by turning the (+) type driver (Ø 3 ~ Ø 4) on the base A/C groove.

Connection Diagram



Waveform



8. Check of Traveling Device after Deck Assembly

8-1. Audio, RF Normalization Time (Locking Time) Check in Play after CUE or REV

Fixtures and tools used	Measuring standard	Connection position	VCR (VCP) status
• Oscilloscope • 6H 3KHz Color Bar Standard Test tape • Stop Watch	• RF Locking Time: Within 5 seconds • Audio Locking Time : Within 10 seconds	• CH-1: PB RF Envelope • CH-2: Audio output • RF Envelope output point • Audio output jack	• Play the 6H 3KHz Color Bar Standard Test tape.

Checking Procedure

1) Check that locking time of the RF and Audio waveform is fallen within the measuring standard in conversion of the play mode from the CUE or the REV mode.
2) Readjust the paragraph 5 and 6 if it deviates from the standard.

8-2. Check of Tape Curl and Jam Status

Fixtures and tools used	Fixtures and tools used	Fixtures and tools used
• T-160 Tape • T-120 Tape	• There must be no jam or curl at the first, middle and end position of tape.	• Travel the tape at the position of its first and end.

Checking Procedure

1) Check there is no abnormality of every traveling post status.
2) There must be no abnormal operation of the counter in occurrence of folding of the bottom tape. There must be not abnormality of audio signal in damage of the top tape.
3) If there is abnormality, readjust the adjustment paragraph 4 and 5.

1. Checking Points prior to Repair

Following abnormal phenomena may be repaired by removal of foreign materials and oil supply. Check oiling is required at the checking set or cleaning status is complete. Determine that necessity of checking and repair the set exists after checking the using period of the set together with the user. In this case, followings must be checked:

Phenomena	Checking Points and Cause	Replace-ment
Color beat	Pollution of Full-Erase Head	o
S/N, Color Faded	Pollution of Video Head	o
Horizontal, Vertical Jitte	Pollution of Video Head or Tape Transport System	o
Poor Sound, Low Sound	Pollution of Audio/Control Head	o
No tape wound or tape wound loosely. FF or REW impossible, or slow turning	Pollution of Pinch Roller or Belt Capstan Belt	o
Tape loosely wound in REV or Unloading	Deterioration of Clutch Assembly D37 Torque	o
	Pollution of Drum and Traveling Device	Fig. C-9-3

CAUTIONS

If operation of the position with (O) mark is abnormal even after removing cause, replace it with substitute product since it shows damage or wearing.

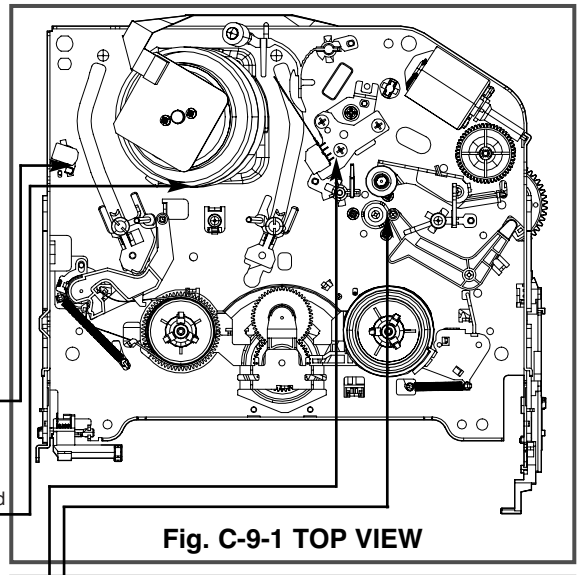


Fig. C-9-1 TOP VIEW

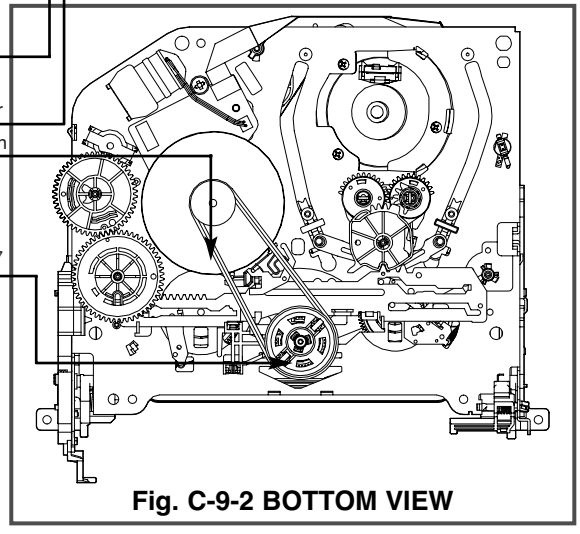


Fig. C-9-2 BOTTOM VIEW

*** No. (1) ~ (12) shows sequence that the tape moves from the supply reel to the take-up reel.)**

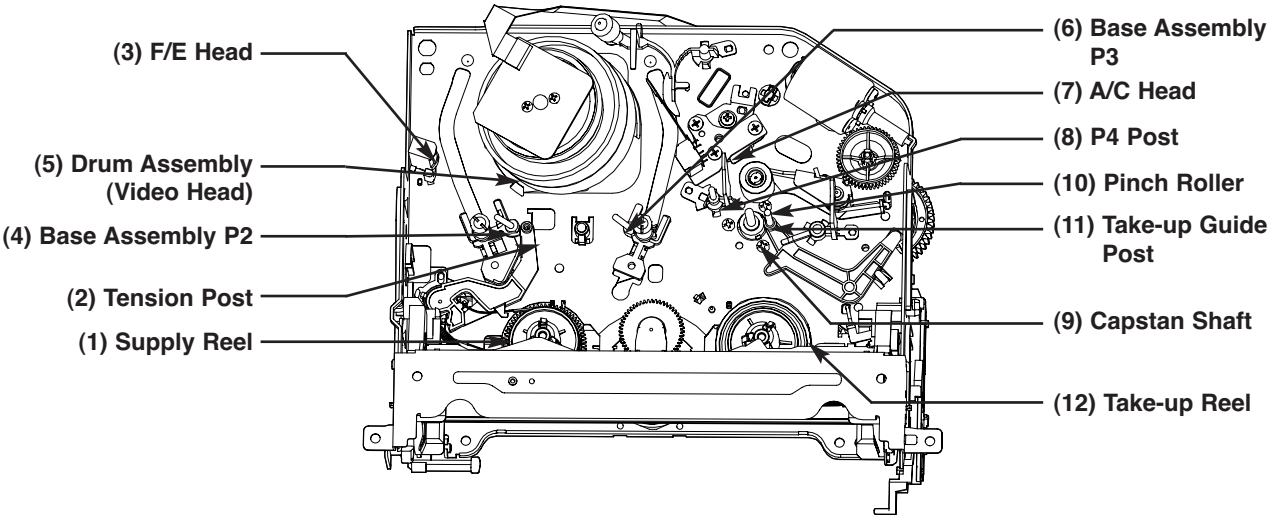


Fig. C-9-3 Tape Transport System

2. Essential Check and Repair

Recording density of the video is far higher than the audio. Therefore video parts are very precise so as to allow only error of 1/1000mm or so in order to maintain compatibility with other videos.
If one of these parts is polluted or old, same phenomena will appear as they are damaged.
To maintain clear screen, regular check, replacement of old and damaged parts and oil supply, etc are essential.

3. Regular Check and Repair

Check and repair schedule is not constant since they vary depending on method that the consumer uses video and environment where the video is installed at.
However, for the video used by common household, good screen will be maintained if regular check and repair per 1,000 hour is performed. The following chart shows relationship between using time and checking time:

Table 1

Time Requiring Checking / Average hours used per day	About 1 year	About 18 months	About 3 years
One hour	■	■	■
Two hours	■	■	
Three hours	■		

4. Tools for Check and Repair

(1) Grease: Floil G-3114 (KANTO) or equivalent grease (Green)
(2) Grease: Kanto G-754, PL-433 (Yellow)
(3) Alcohol (Isopropyl Alcohol)
(4) Cleaning Patch (cloth)

5. Maintenance Process

5-1) Removal of Foreign Material

(1) Removal of foreign material from video head (Fig. C-9-4)
Firstly try to use a cleaning tape.
Use a cleaning patch if foreign materials are not removed with the cleaning tape due to severe dirty of the head. Soak the cleaning patch in alcohol and put it to the head tip. Smoothly turn the drum (turning cylinder) to the right or left (In this case, the cleaning patch must not be moved vertically).
After completely drying the head, test the traveling status of the tape.
If alcohol (Isopropyl Alcohol) remains at the video head, the tape may be damaged when this solution touches with the head surface.

Never use a cloth bar (commercial sale)

(2) Wipe the tape transport system and the drive system with the cleaning patch soaked in alcohol (Isopropyl Alcohol) when removing foreign materials from them.
1) The part touched with the traveling tape is called as tape transport system. The drive system consists of parts to travel the tape.
2) Care must be exercised so that unreasonable force to change the pattern will be applied to the tape transport system during removal of foreign materials.

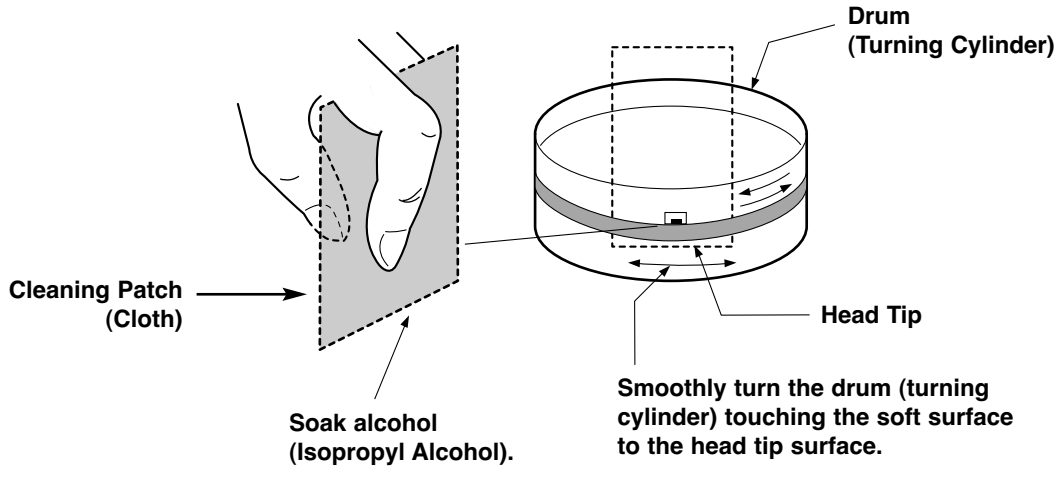


Fig. C-9-4

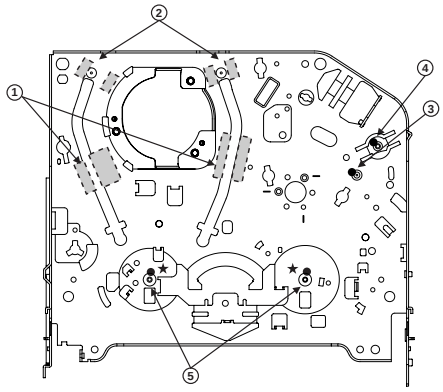
5-2) Grease Applications

(1) Grease Application Method

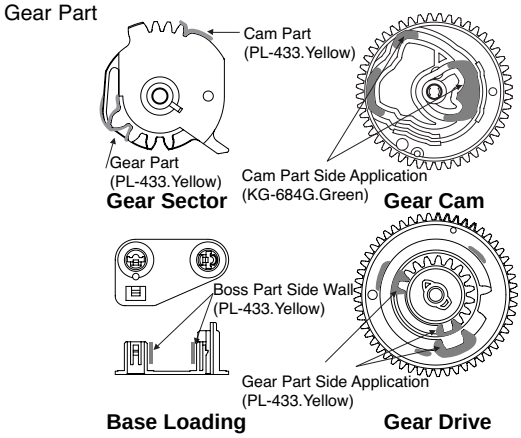
Apply grease by using a cloth swab or brush. Care must be exercised so that excess quantity should not be used. If the excessive quantity is applied, wipe it with the gauze soaked in alcohol (Isopropyl Alcohol).

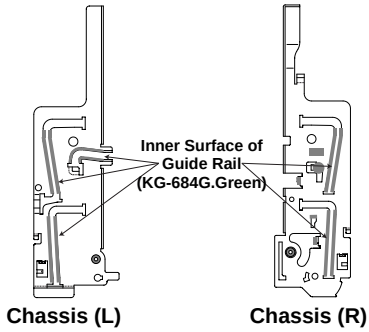
NOTE: POSITION OF GREASE APPLICATION

(1) Inner Side Surface and Top Surface of Loading Path
(2) Stable Adhesion Part of Base P2, P3
(3) Arm Pinch Shaft
(4) Gear Wheel Shaft
(5) Reel S. T. Shaft
(1) (2) (3) (4): KG-684G (Green)
(5): PL-433 (Yellow)



Chassis (TOP)

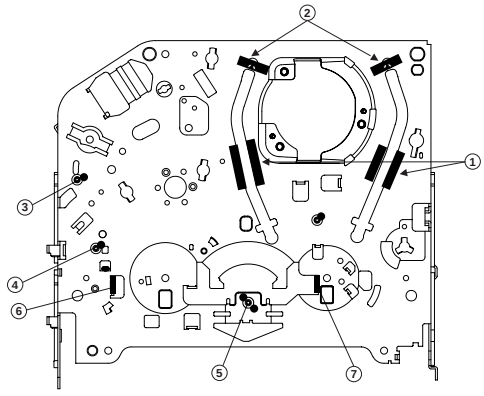




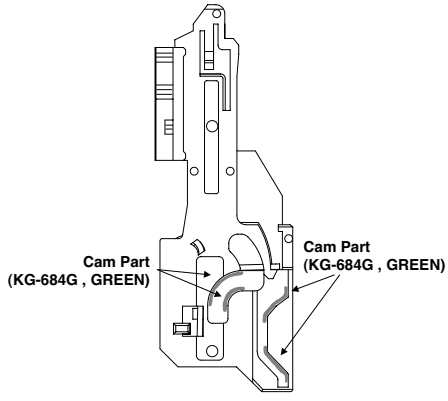
(2) Regular Grease Application

Apply grease to the designated application position every 500 hour.

(1) Inner Side Surface and Top Surface of Loading Path
(2) Stable Adhesion Part of Base P2, P3 Coil
(3) Gear Cam Shaft
(4) Gear Drive Shaft
(5) Clutch Shaft Groove
(6) Guide Part on the Plate Slider Side Wall (Left)
(7) Guide Part on the Plate Slider Side Wall (Right)
(1) (2) (3) (4) (5) (6) (7): KG-684G (Green)



Chassis (Bottom)



Gear Rack F/L

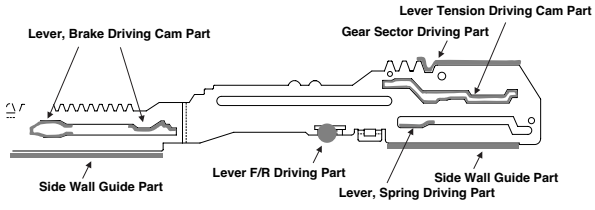
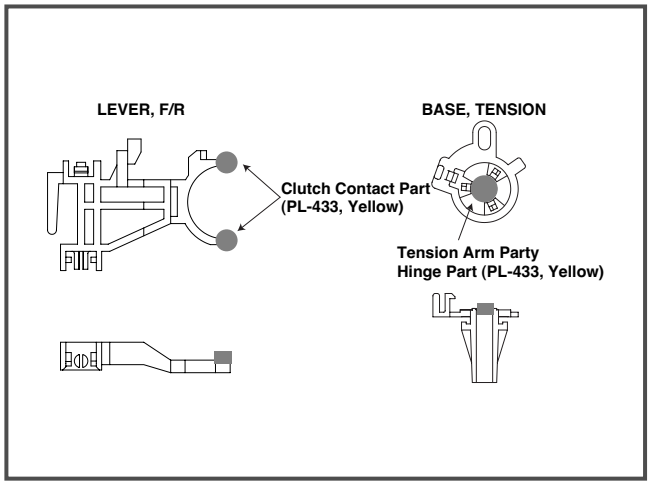
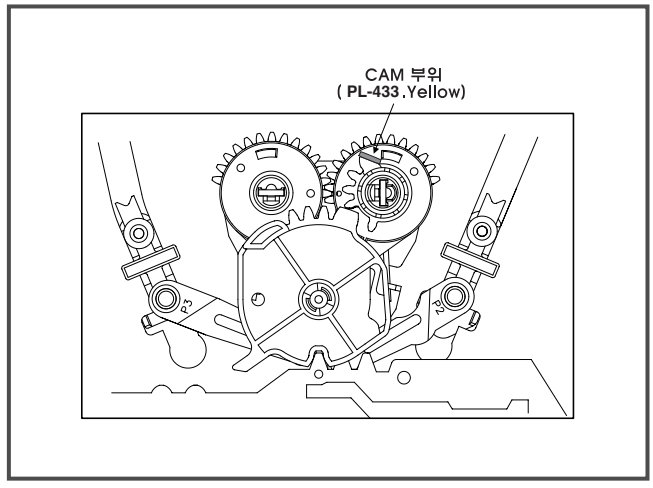

Lever, Brake Driving Cam Part
Lever Tension Driving Cam Part
Gear Sector Driving Part
Side Wall Guide Part
Lever F/R Driving Part
Side Wall Guide Part
Lever, Spring Driving Part

Plate Slider

Lever, F/R, Base, Tension

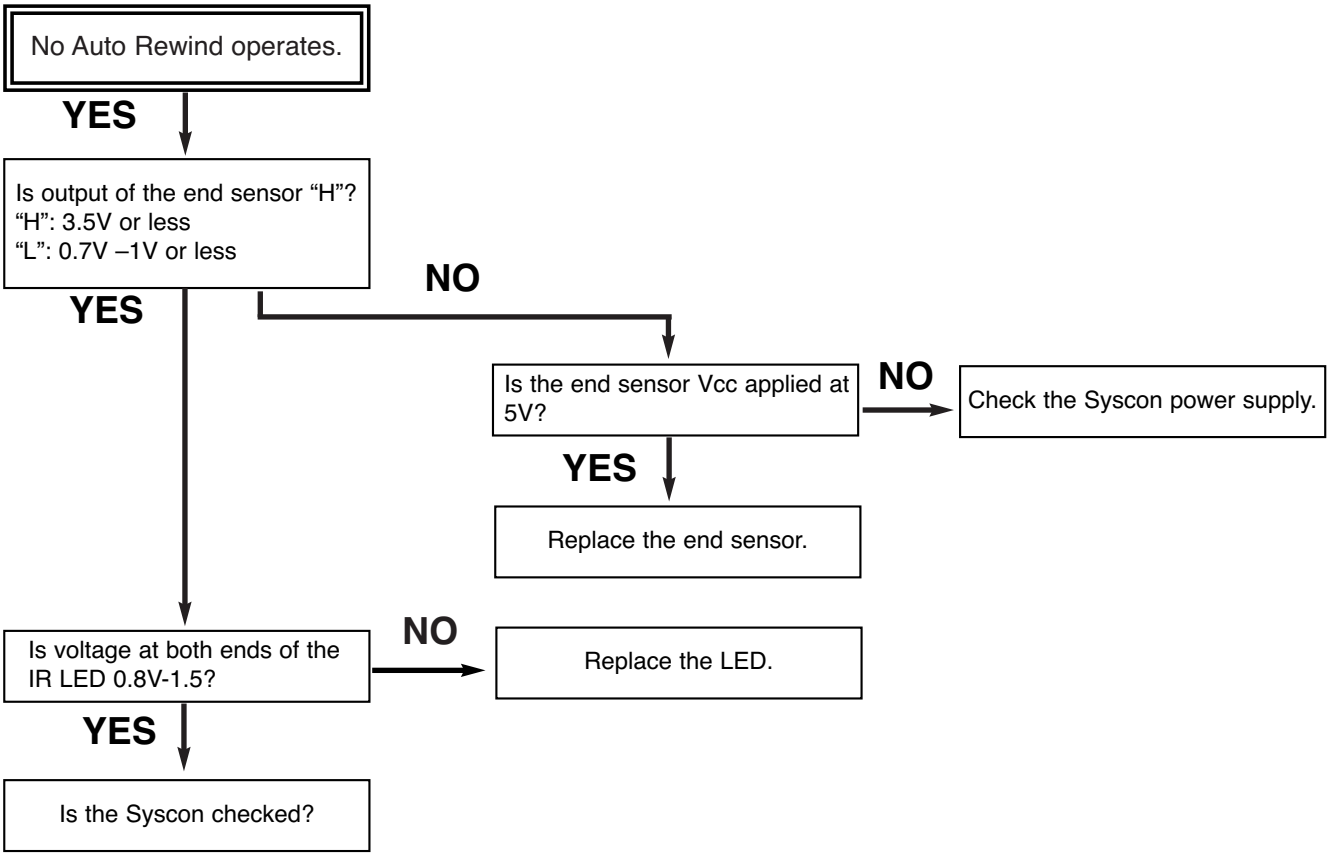


GEAR AY, P2 & P3

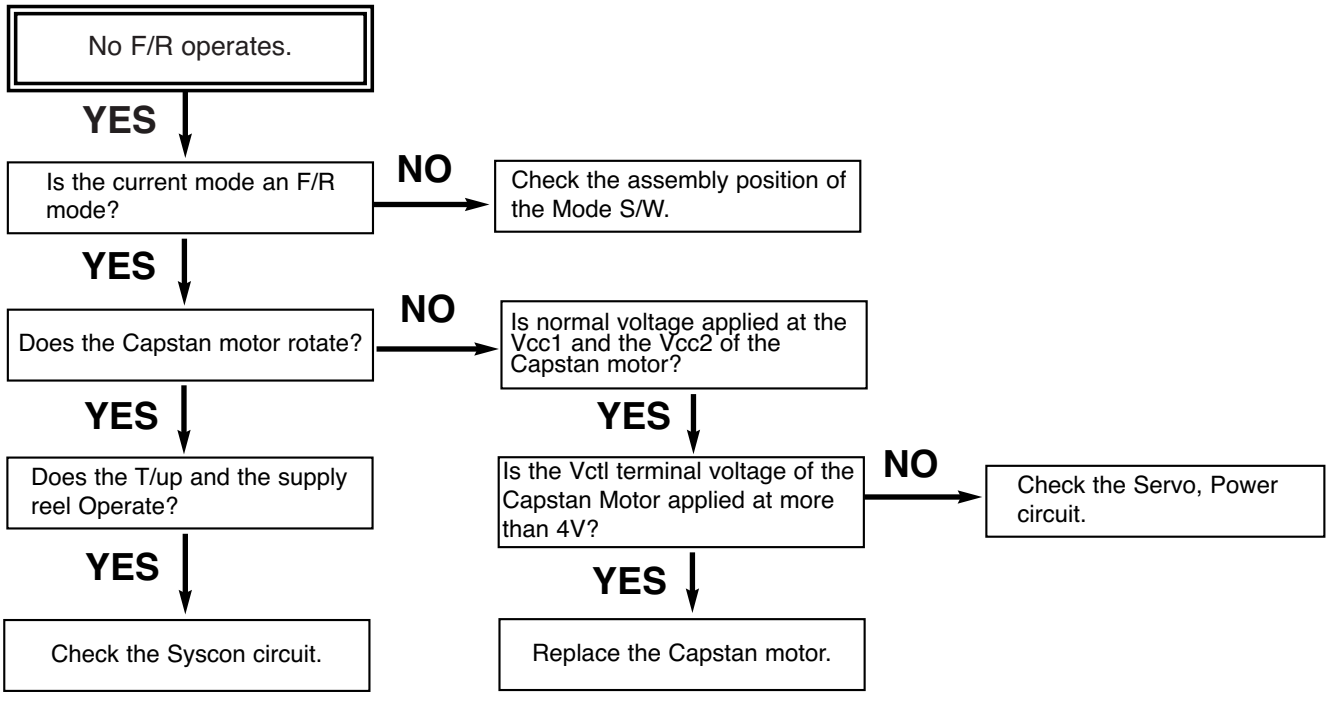


1.Deck Mechanism

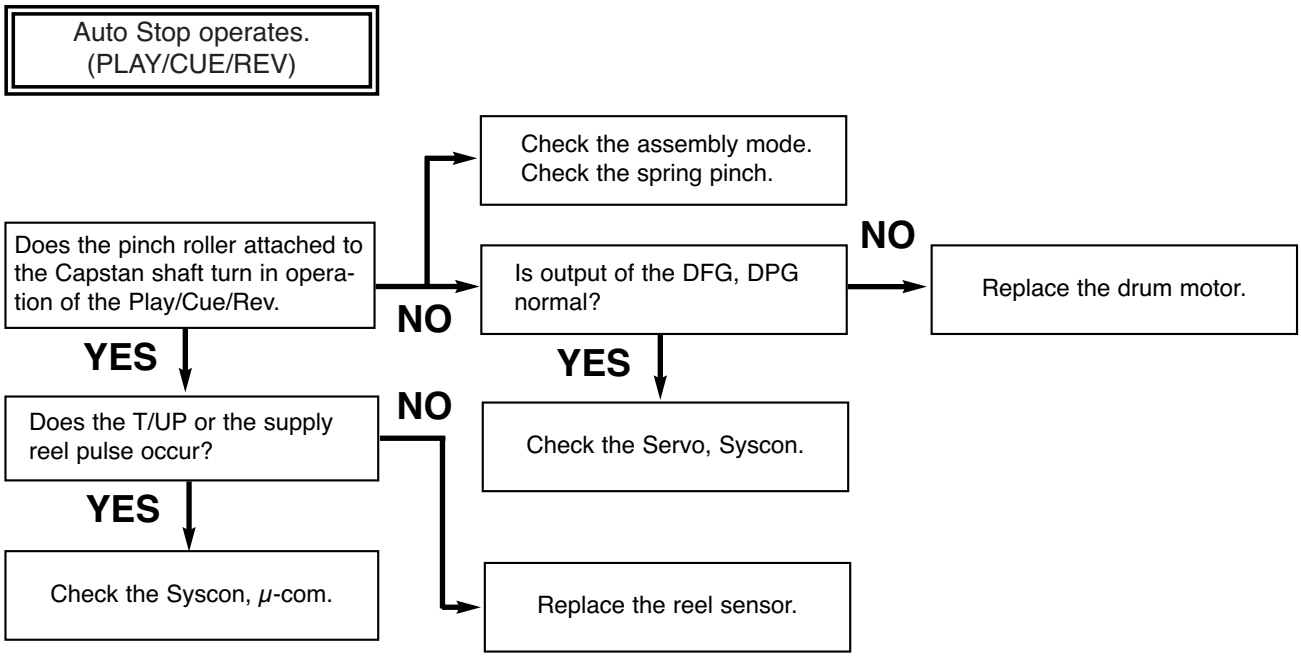
A.



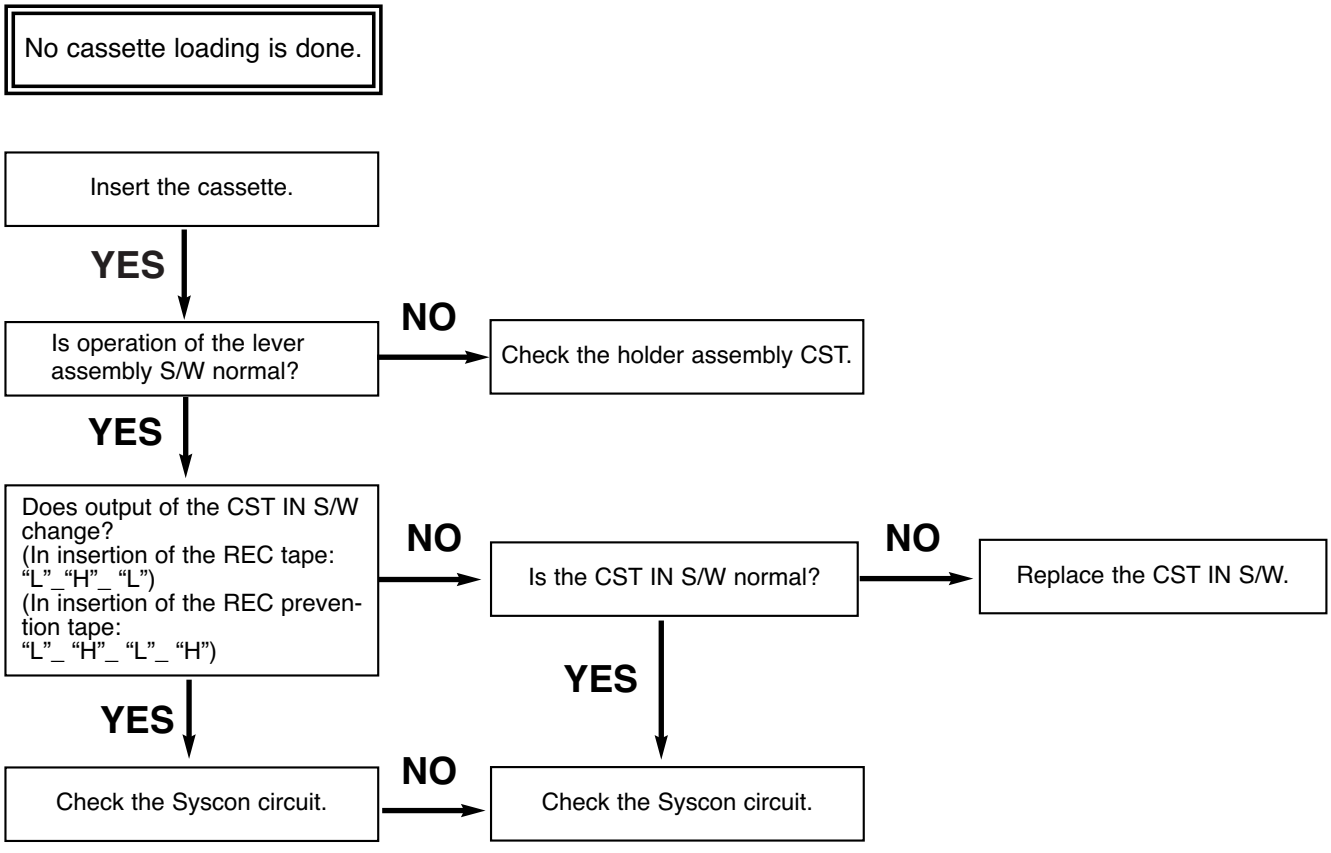
B.


No F/R operates.
YES
Is the current mode an F/R mode?
NO
Check the assembly position of the Mode S/W.
YES
Does the Capstan motor rotate?
NO
Is normal voltage applied at the Vcc1 and the Vcc2 of the Capstan motor?
YES
YES
Does the T/up and the supply reel Operate?
Is the Vctl terminal voltage of the Capstan Motor applied at more than 4V?
NO
Check the Servo, Power circuit.
YES
YES
Check the Syscon circuit.
Replace the Capstan motor.

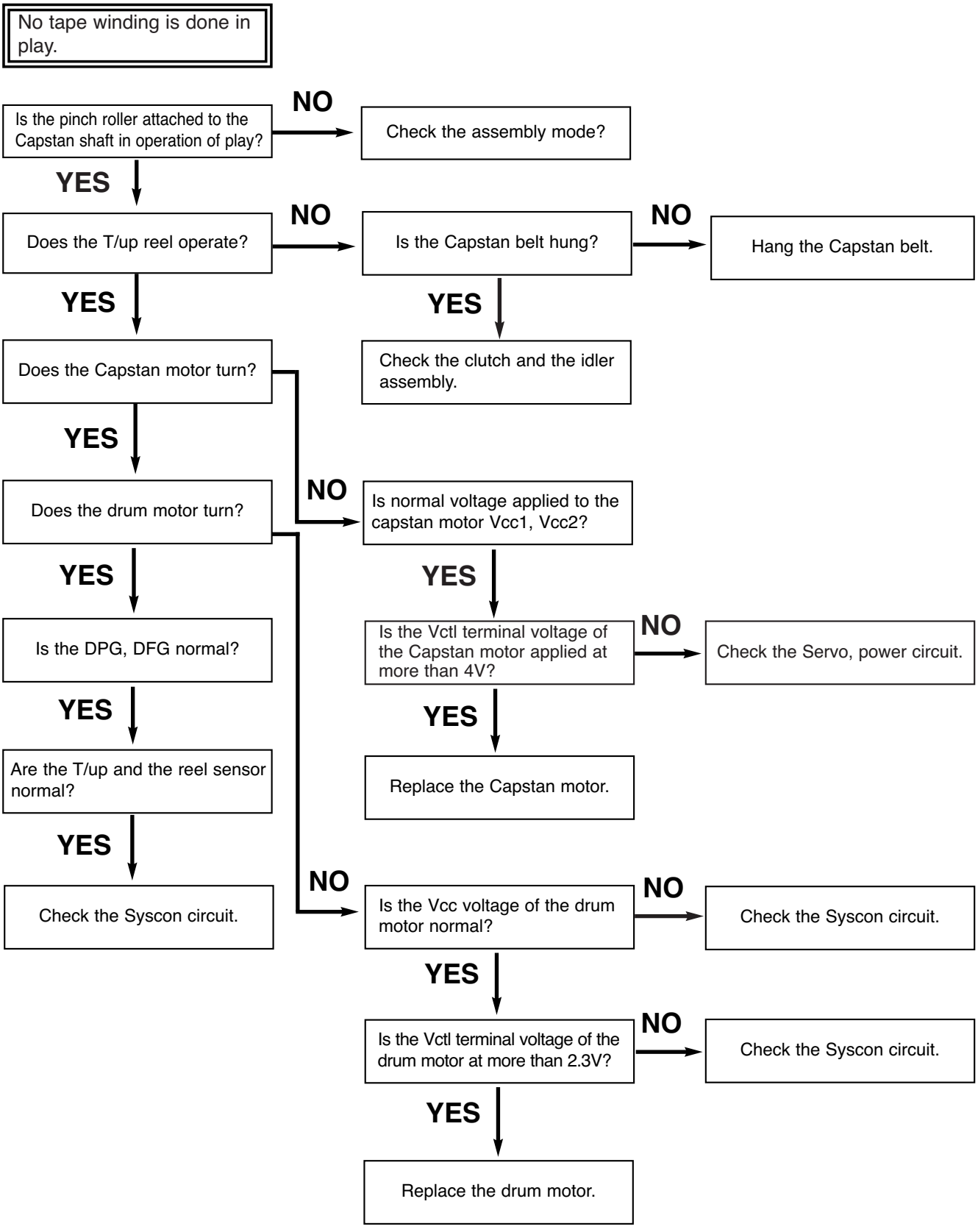
C.


Auto Stop operates.
(PLAY/CUE/REV)
Does the pinch roller attached to the Capstan shaft turn in operation of the Play/Cue/Rev.
NO
Check the assembly mode.
Check the spring pinch.
Is output of the DFG, DPG normal?
NO
Replace the drum motor.
YES
YES
Does the T/UP or the supply reel pulse occur?
NO
Check the Servo, Syscon.
YES
Check the Syscon, μ-com.
Replace the reel sensor.

D.

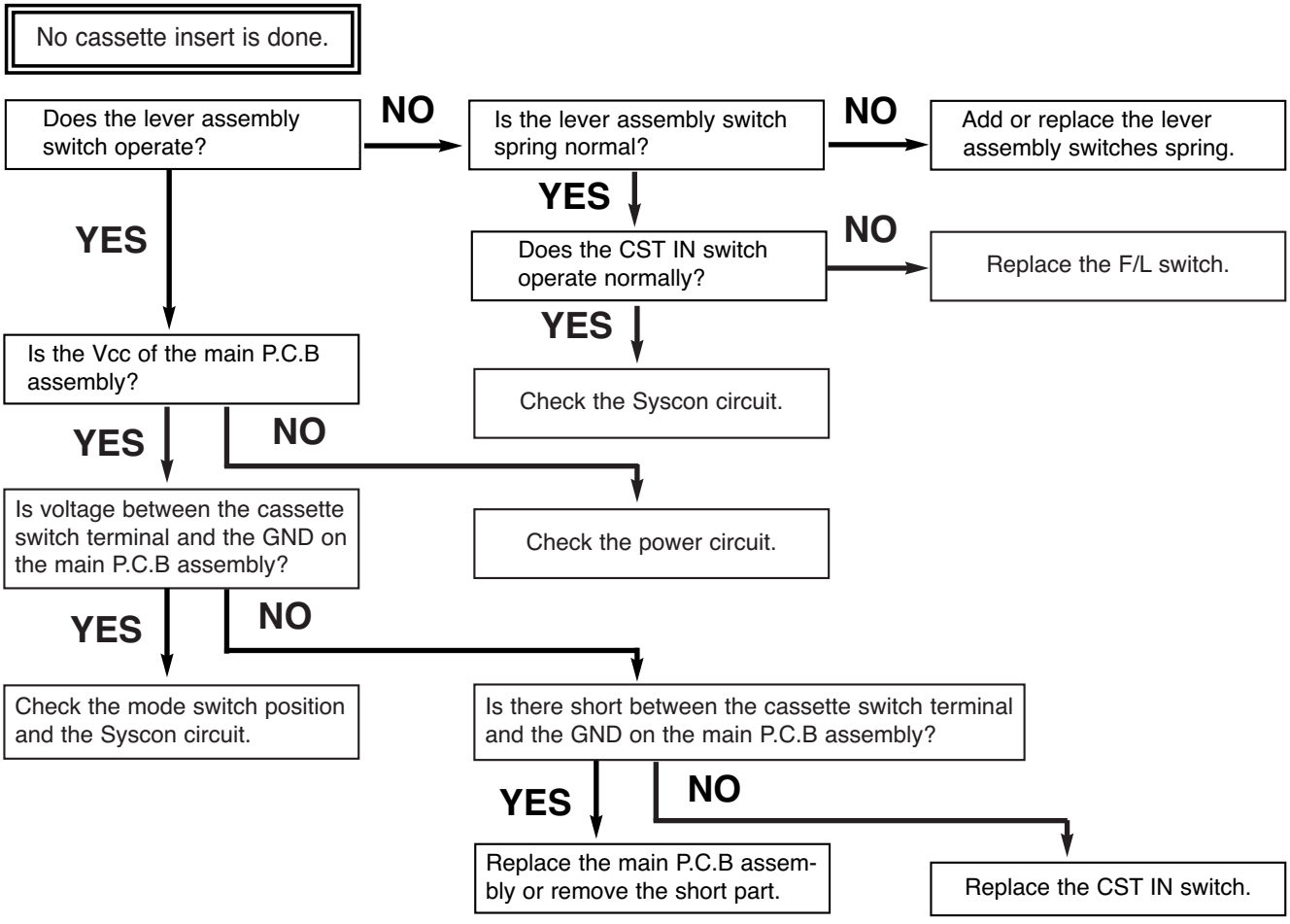

No cassette loading is done.
Insert the cassette.
YES
Is operation of the lever assembly S/W normal?
NO
Check the holder assembly CST.
YES
Does output of the CST IN S/W change?
(In insertion of the REC tape:
"L"_"H"_"L")
(In insertion of the REC prevention tape:
"L"_"H"_"L"_"H")
NO
Is the CST IN S/W normal?
NO
Replace the CST IN S/W.
YES
YES
Check the Syscon circuit.
NO
Check the Syscon circuit.

E.

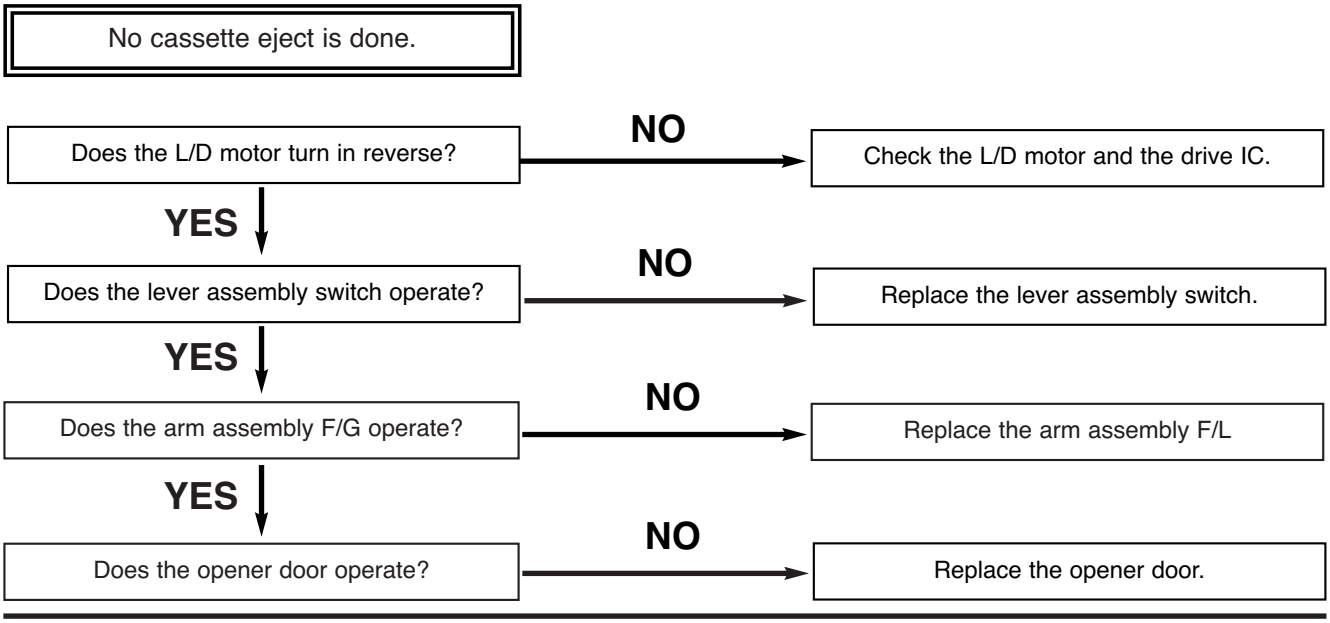

No tape winding is done in play.
Is the pinch roller attached to the Capstan shaft in operation of play?
NO
Check the assembly mode?
YES
Does the T/up reel operate?
NO
Is the Capstan belt hung?
NO
Hang the Capstan belt.
YES
YES
Check the clutch and the idler assembly.
Does the Capstan motor turn?
YES
Does the drum motor turn?
NO
Is normal voltage applied to the capstan motor Vcc1, Vcc2?
YES
YES
Is the DPG, DFG normal?
Is the Vctl terminal voltage of the Capstan motor applied at more than 4V?
NO
Check the Servo, power circuit.
YES
YES
Are the T/up and the reel sensor normal?
Replace the Capstan motor.
YES
NO
Check the Syscon circuit.
Is the Vcc voltage of the drum motor normal?
NO
Check the Syscon circuit.
YES
Is the Vctl terminal voltage of the drum motor at more than 2.3V?
NO
Check the Syscon circuit.
YES
Replace the drum motor.

2. Front Loading Mechanism

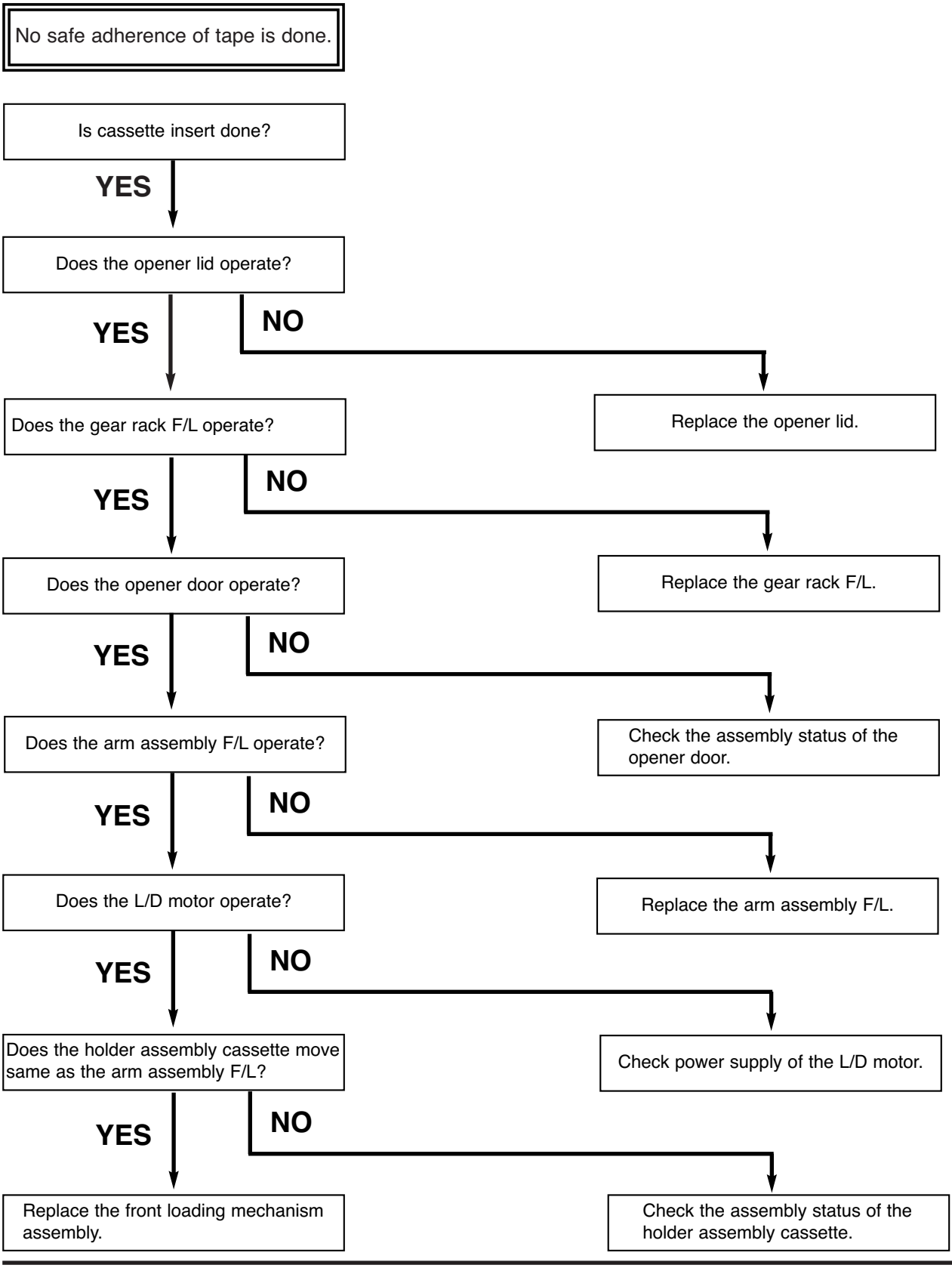
A.


No cassette insert is done.
Does the lever assembly switch operate?
NO
Is the lever assembly switch spring normal?
NO
Add or replace the lever assembly switches spring.
YES
YES
Does the CST IN switch operate normally?
NO
Replace the F/L switch.
YES
Is the Vcc of the main P.C.B assembly?
Check the Syscon circuit.
YES
NO
Is voltage between the cassette switch terminal and the GND on the main P.C.B assembly?
Check the power circuit.
YES
NO
Check the mode switch position and the Syscon circuit.
Is there short between the cassette switch terminal and the GND on the main P.C.B assembly?
YES
NO
Replace the main P.C.B assembly or remove the short part.
Replace the CST IN switch.

B.

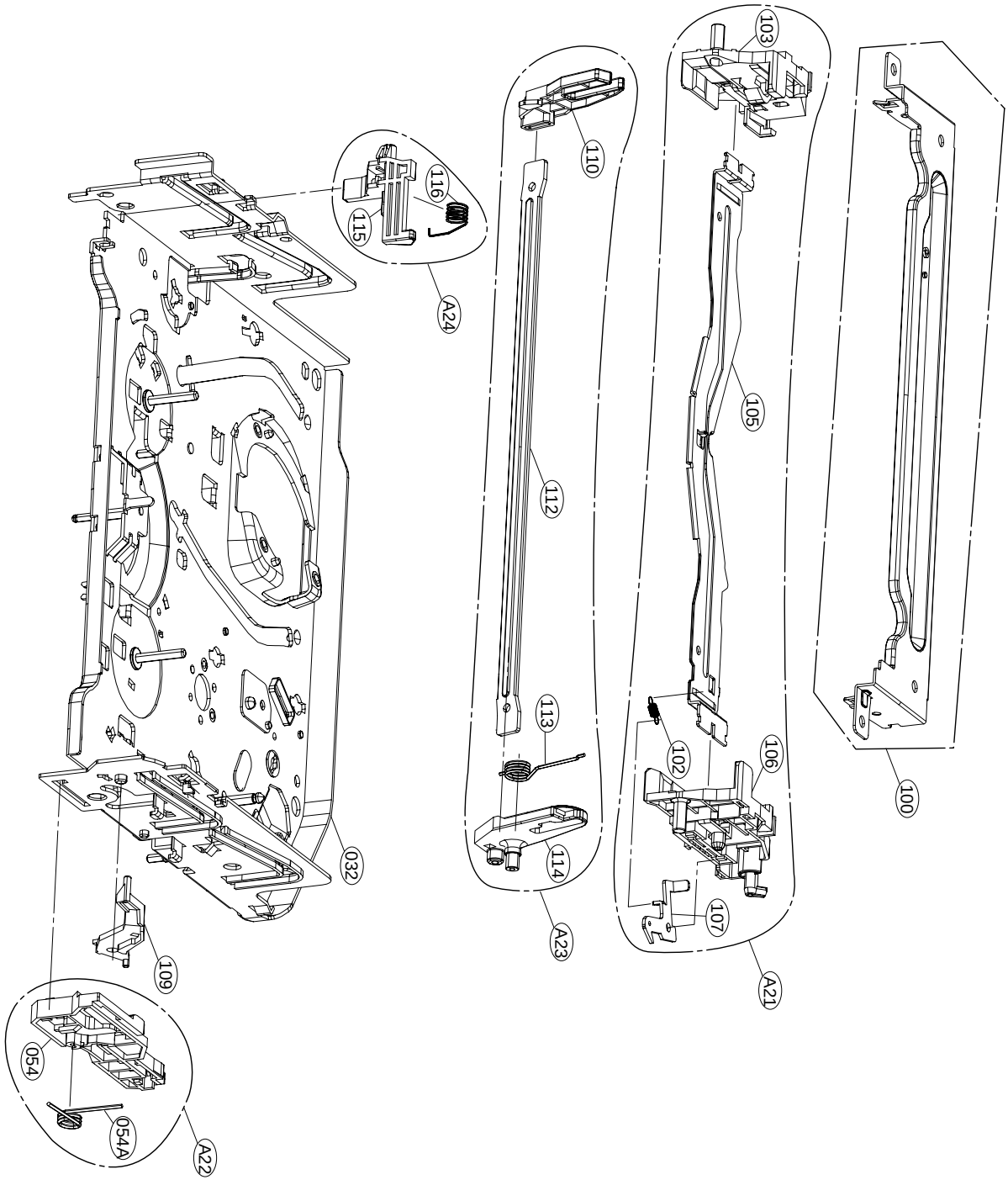


C.


No safe adherence of tape is done.
Is cassette insert done?
YES
Does the opener lid operate?
YES
NO
Replace the opener lid.
Does the gear rack F/L operate?
YES
NO
Replace the gear rack F/L.
Does the opener door operate?
YES
NO
Check the assembly status of the opener door.
Does the arm assembly F/L operate?
YES
NO
Replace the arm assembly F/L.
Does the L/D motor operate?
YES
NO
Check power supply of the L/D motor.
Does the holder assembly cassette move same as the arm assembly F/L?
YES
NO
Check the assembly status of the holder assembly cassette.
Replace the front loading mechanism assembly.

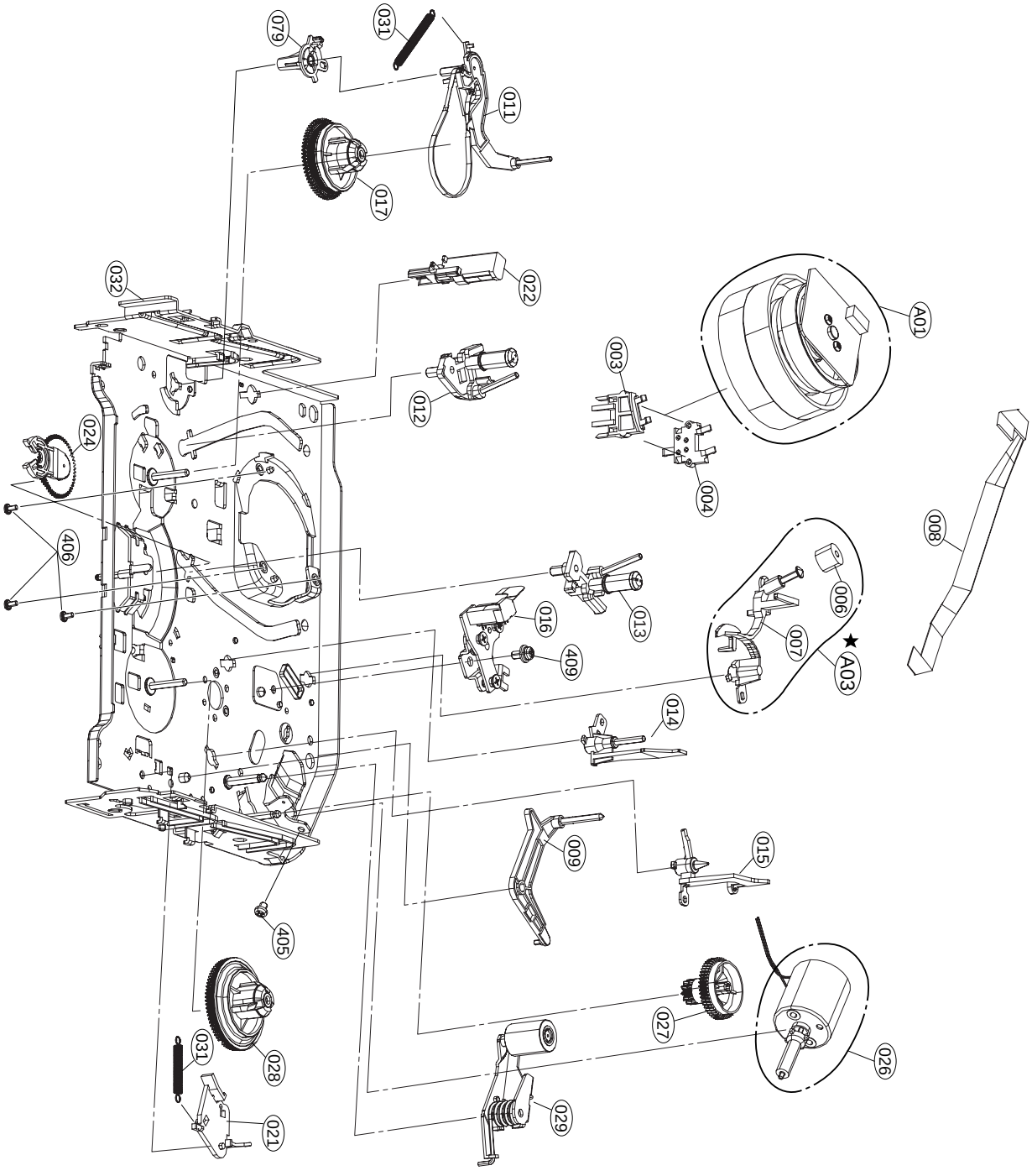
EXPLODED VIEWS

1. Front Loading Mechanism Section

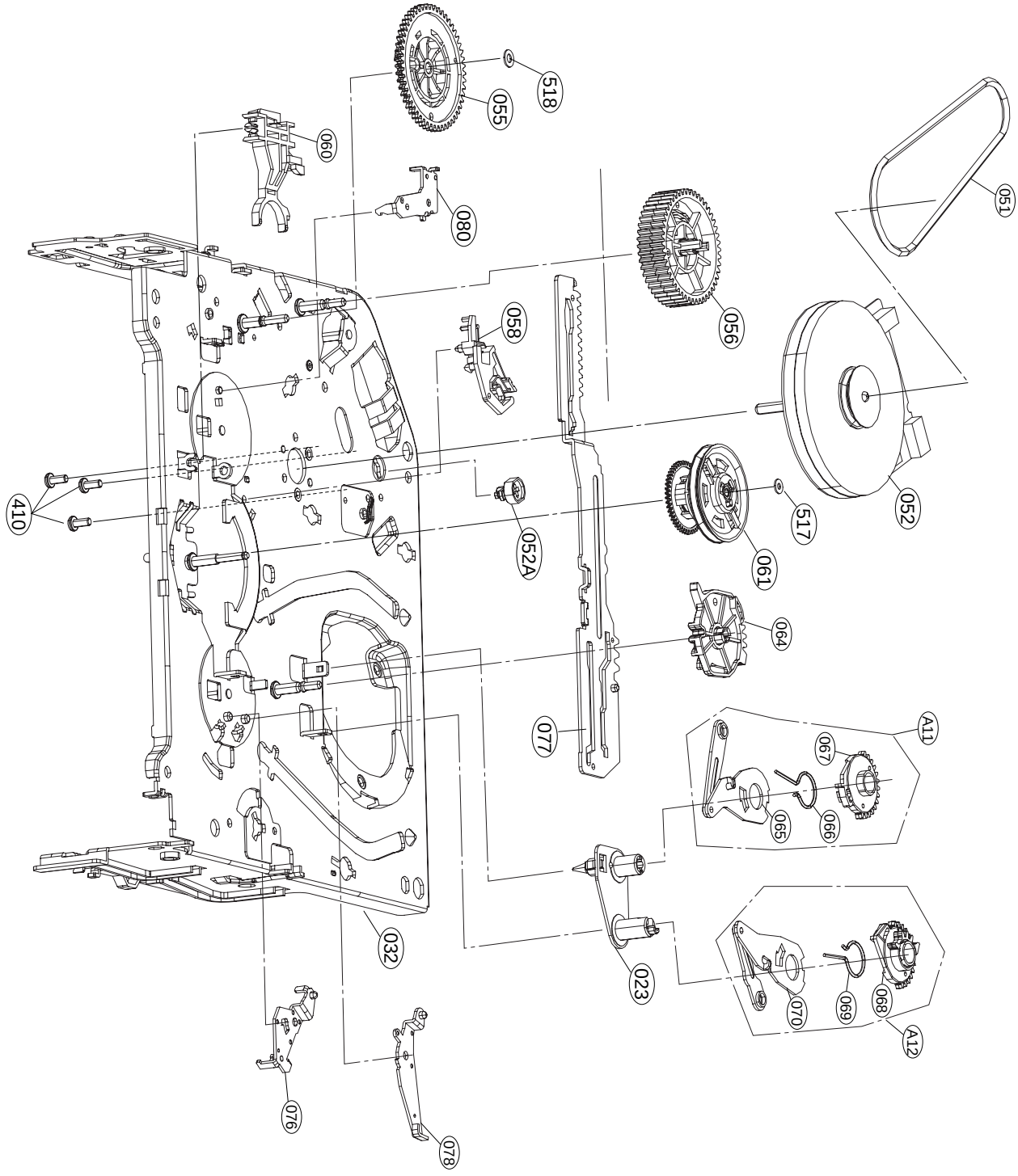


2. Moving Mechanism Section (1)

★ OPTIONAL PART



3. Moving Mechanism Section (2)



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SECTION 5 MECHANISM OF DVD PART

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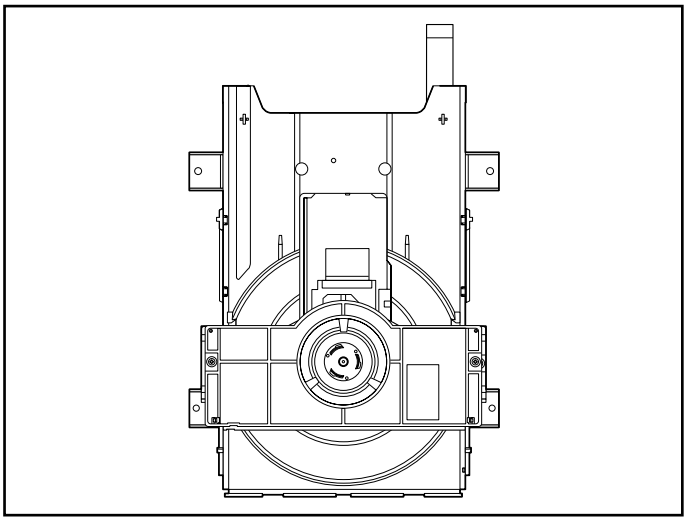
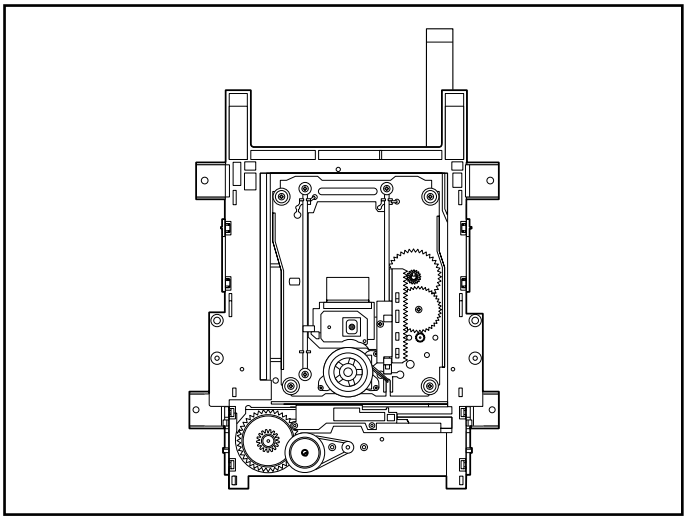
DECK MECHANISM PARTS LOCATION

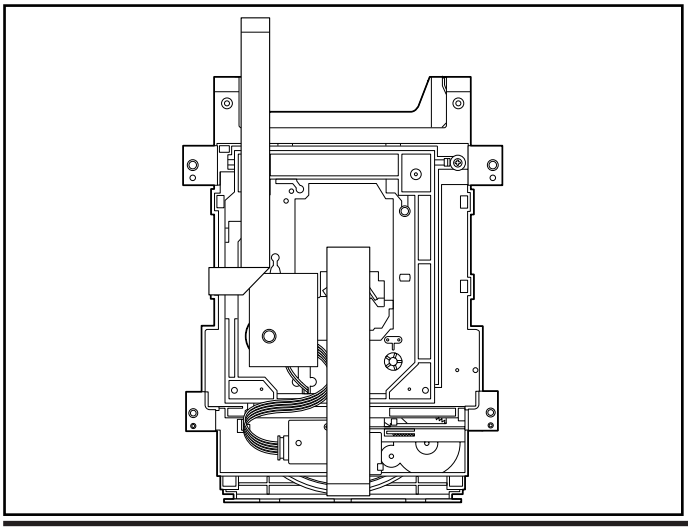
• Top View (With Tray)



• Top View (Without Tray)



• Bottom View



Procedure Starting No.		Parts	Fixing Type	Disassembly	Figure
	1	Holder Clamp	2 Screws, 2 Locking Tabs		5-1
1	2	Clamp Assembly Disc			5-1
1, 2	3	Plate Clamp			5-1
1, 2, 3	4	Magnet Clamp			5-1
1, 2, 3, 4	5	Clamp Upper			5-1
1	6	Tray Disc			5-2
1, 6	7	Base Assembly Sled			5-3
1, 2, 6	8	Gear Assembly Feed	4 Screws, 1 Connector 1 Locking Tabs		5-3
1, 2, 6, 8	9	Gear Middle			5-3
1, 2, 6, 8, 9	10	Gear Assembly Rack	1 Screw		5-3
1, 2, 7	11	Rubber Rear			5-3
1, 2, 7	12	Frame Assembly Up/Down	1 Screw	Bottom	5-4
1, 2	13	Belt Loading	1 Locking Tab		5-4
1, 2 ,13	14	Gear Pulley			5-4
1, 2, 13, 14	15	Gear Loading	1 Locking Tab		5-4
1, 2, 7, 12, 13, 14	16	Guide Up/Down			5-4
1, 2, 13	17	PWB Assembly Loading	1 Locking Tab 1 Hook 2Screw	Bottom	5-4
1, 2, 7, 12, 13, 14, 15, 16, 17	18	Base Main	2 Locking Tabs		5-4

Note

When reassembling, perform the procedure in reverse order.

The “Bottom” on Disassembly column of above Table indicates the part should be disassembled at the Bottom side.

DECK MECHANISM DISASSEMBLY

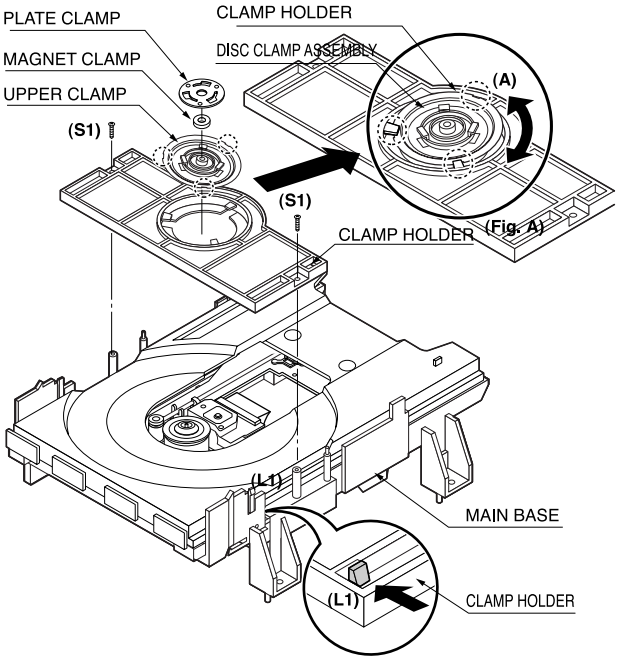


Fig. 5-1

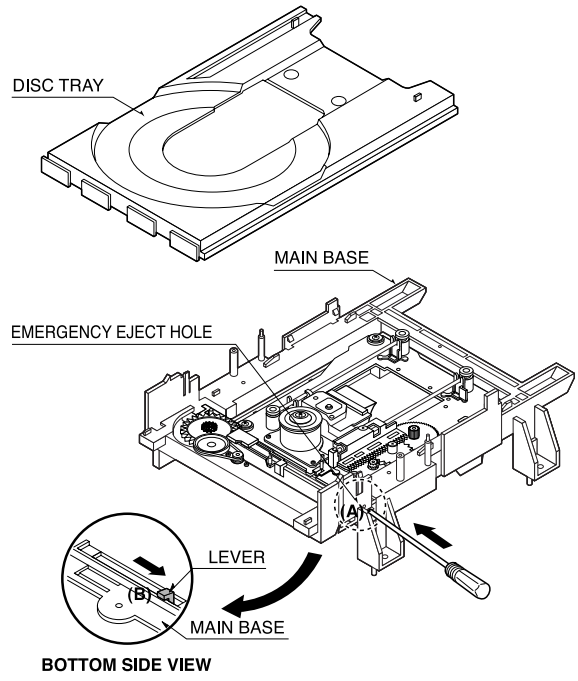


Fig. 5-2

1. Holder Clamp (Fig. 5-1)

1) Release 2 Screws(S1).
2) Unhook 2 Locking Tabs(L1).
3) Lift up the Holder Clamp and then separate it from the Base Main.

1-1. Clamp Assembly Disc

1) Place the Clamp Assembly Disc as Fig. (A)
2) Lift up the Clamp Assembly Disc in direction of arrow(A).
3) Separate the Clamp Assembly Disc from the Holder Clamp.

1-1-1. Plate Clamp

1) Turn the Plate Clamp to counterclockwise direction and then lift up the Plate Clamp.

1-1-2. Magnet Clamp

1-1-3. Clamp Upper

2. Tray Disc (Fig. 5-2)

1) Insert and push a Driver in the emergency eject hole(A) at the right side, or put the Driver on the Lever(B) of the Gear Emergency and pull the Lever(B) in direction of arrow so that the Tray Disc is ejected about 15~20mm.
2) Pull the Tray Disc until it is separated from the Base Main completely.

DECK MECHANISM DISASSEMBLY

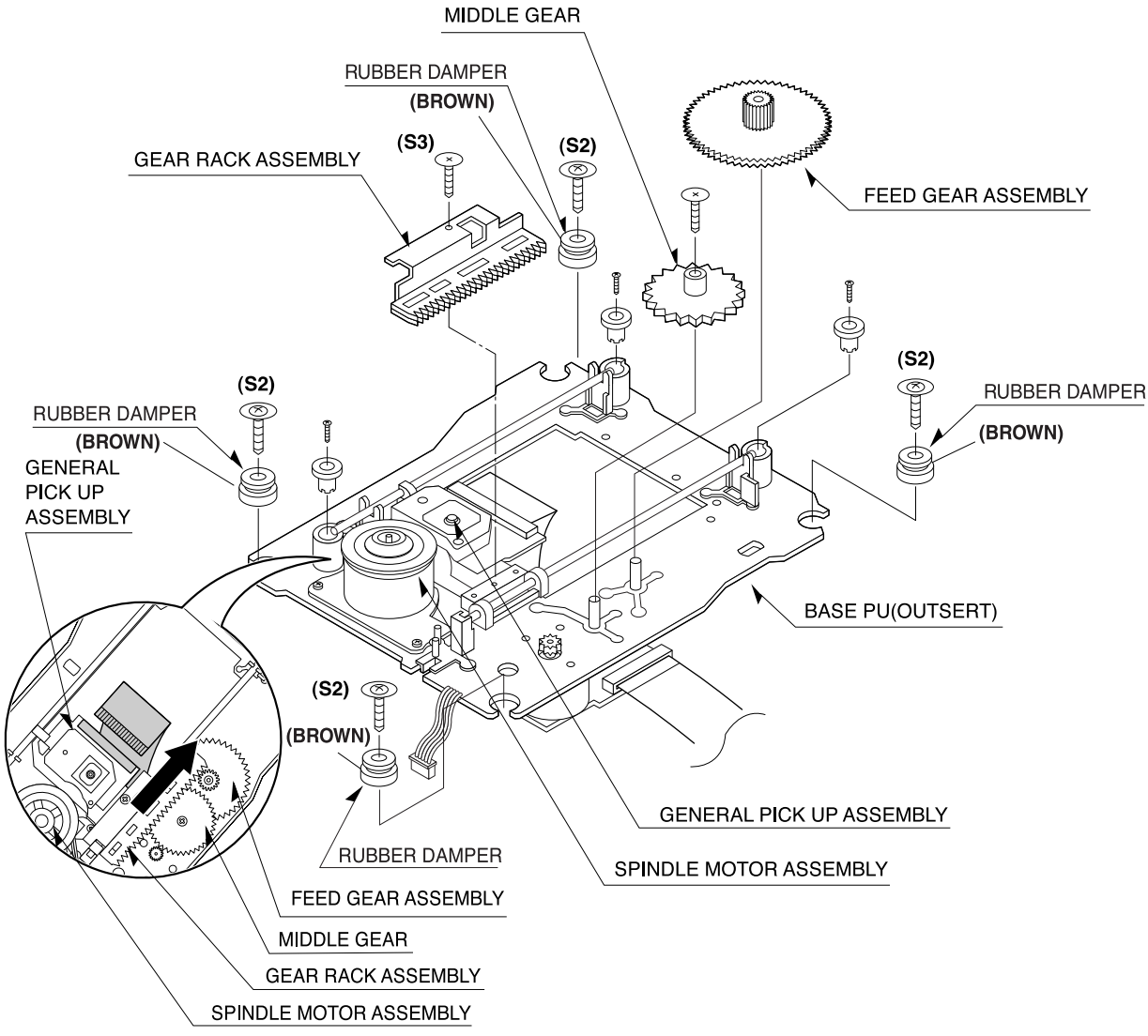


Fig. 5-3

3. Base Assembly Sled (Fig. 5-3)

1) Release 4 Screw(S2).
2) Disconnect the FFC Connector(C1)

3-1. Gear Assembly Feed

3-2. Gear Middle

3-3. Gear Assembly Rack

1) Release the Scerw(S3)

4. Rubber Rear (Fig. 5-3)

DECK MECHANISM DISASSEMBLY

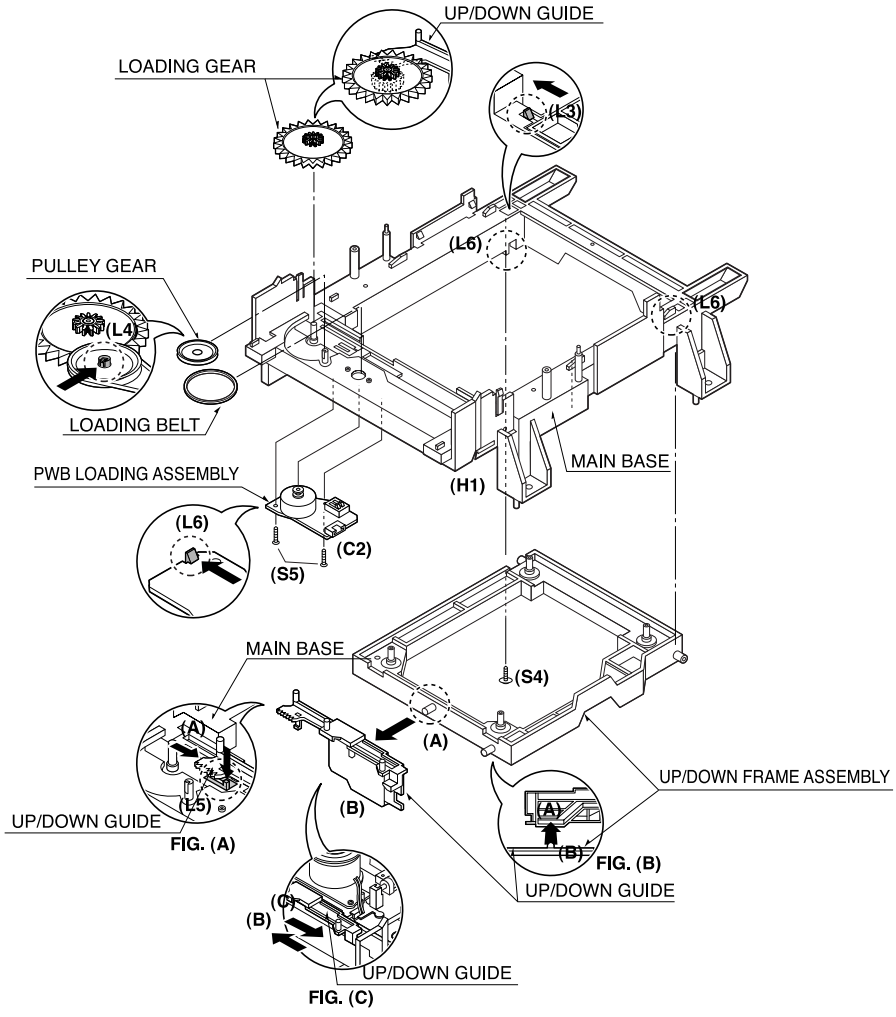


Fig. 5-4

5. Frame Assembly Up/Down (Fig. 5-4)

Note

Put the Base Main face down(Bottom Side)

1) Release the Screw(S4)
2) Unlock the Locking Tab(L3) in direction of arrow and then lift up the Frame Assembly Up/Down to separate it from the Base Main.

Note

- When reassembling move the Guide Up/Down in direction of arrow(C) until it is positioned as Fig.(C).
- When reassembling insert (A) portion of the Frame Assembly Up/Down in the (B) portion of the Guide Up/Down as Fig.(B)

6. Belt Loading(Fig. 5-4)

Note

Put the Base Main on original position(Top Side)

7. Gear pulley (Fig. 5-4)

1) Unlock the Locking Tab(L4) in direction of arrow(B) and then separate the Gear Pulley from the Base Main.

8. Gear Loading (Fig. 5-4)

9. Guide Up/Down (Fig. 5-4)

1) Move the Guide Up/Down in direction of arrow(A) as Fig.(A)
2) Push the Locking Tab(L5) down and then lift up the Guide Up/Down to separate it from the Base Main.

Note

When reassembling place the Guide Up/Down as Fig.(C) and move it in direction arrow(B) until it is locked by the Locking Tab(L5). And confirm the Guide Up/Down as Fig.(A)

10. PWB Assembly Loading (Fig. 5-4)

Note

Put the Base Main face down(Bottom Side)

1) Release 2 Screws(S5)
2) Unlock the Loading Motor (C2) from the Hook (H1) on the Base Main.
3) Unlock 2 Locking Tabs(L6) and separate the PWB Assembly Loading from the Base Main.

11. Base Main(Fig. 5-4)

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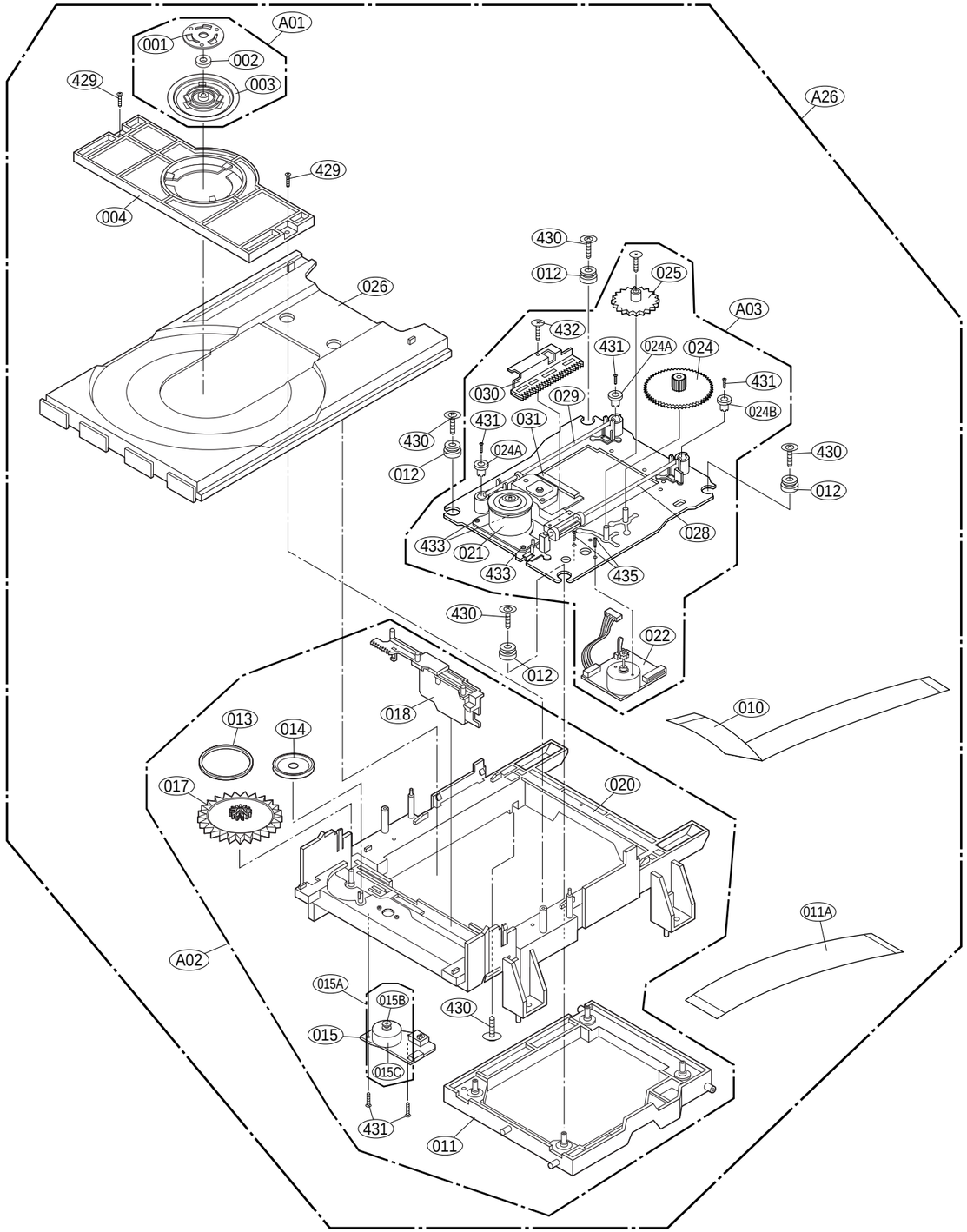
EXPLODED VIEWS

1. Deck Mechanism Exploded View



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